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CRPL-F 237 PART A

FOR OFFICIAL USE

PART A
IONOSPHERIC DATA

ISSUED
MAY 1964

U. S. DEPARTMENT OF COMMERCE
NATIONAL BUREAU OF STANDARDS
CENTRAL RADIO PROPAGATION LABORATORY
BOULDER, COLORADO

CRPL-F 237
PART A

NATIONAL BUREAU OF STANDARDS
CENTRAL RADIO PROPAGATION LABORATORY
BOULDER, COLORADO

Issued
21 May 1964

IONOSPHERIC DATA

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IONOSPHERIC DATA

The CRPL-F series bulletins are issued as part of the responsibility of the Central Radio Propagation Laboratory for the exchange and distribution of ionospheric and related geophysical data. Part A, "Ionospheric Data," and Part B, "Solar-Geophysical Data," of the CRPL-F series present a variety of data in convenient form for use in research in radio propagation and the ionosphere and in other geophysical problems.

The current form of the tables of ionospheric data provides the monthly medians and, in addition, the number of values entering into the median determination (count) for all ionospheric characteristics listed. Also, when available, the upper and lower quartile values indicated by UQ and LQ in the tables, are listed for f_oF_2 , $h'F_2$, $h'F$, and $M(3000)F_2$. Quartile values are not listed for the other characteristics because of space limitations. The tables are prepared by IBM machine methods.

Beginning with CRPL-F221, Part A, "Ionospheric Data," the hourly median values for the graphs of critical frequencies and $M(3000)F_2$ were plotted by machine methods instead of manually, as in earlier issues. Graphs of critical frequencies and $M(3000)F_2$ will continue to appear. Graphs of percentage of time of occurrence for fEs and virtual heights of the regular ionospheric layers are no longer included. Data on percentage of time of occurrence of fEs above 3, 5, and 7 Mc are available from the CRPL and the IGY World Data Center for Airglow and Ionosphere.

For many years, the tables of ionospheric data appearing in the F series, Part A, listed values of medians recomputed at CRPL. While this practice enforced a certain uniformity, it was subject to some valid criticism for tampering with the original data. The tables and graphs now show the ionospheric data as they are provided by the originating laboratory. Responsibility for the accuracy and reliability of the data rests entirely with the originator.

Medians of data for the U.S. stations are computed in accordance with the recommendations of the World-Wide Soundings Committee. Data will appear in the F series, Part A, only when the complete daily-hourly tabulations have been received by the CRPL or the IGY World Data Center A for Airglow and Ionosphere.

Information on symbols, terminology, and conventions may be found in the "URSI Handbook of Ionogram Interpretation and Reduction, of the World-Wide Soundings Committee," edited by W. R. Piggott and K. Rawer (Elsevir, 1961), which supersedes previous documents. A list of symbols is available from CRPL on request.

The following table contains the latest available information on smoothed observed Zurich sunspot numbers, beginning with the minimum of April 1954. Final numbers are listed through June 1963, the succeeding values being based on provisional data.

Smoothed Observed Zurich Sunspot Number

Month	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
1954				3	4	4	5	7	8	8	10	12
1955	14	16	19	23	29	35	40	46	55	64	73	81
1956	89	98	109	119	127	137	146	150	151	156	160	164
1957	170	172	174	181	186	188	191	194	197	200	201	200
1958	199	201	201	197	191	187	185	185	184	182	181	180
1959	179	177	174	169	165	161	156	151	146	141	137	132
1960	129	125	122	120	117	114	109	102	98	93	88	84
1961	80	75	69	64	60	56	53	52	52	51	50	49
1962	45	42	40	39	39	38	37	35	33	31	30	30
1963	29	30	30	29	29	28	28	27	27	26		
1964												

Units of Ionospheric Data Tables

foF2, foEs - - - Tenths of a megacycle

foF1, foE - - - Hundredths of a megacycle

h'F2, h'F, h'E - Kilometers

M(3000)F2 - - - Hundredths

NOTE: Occasionally, when the median falls between two of the observed values, the median is carried an extra decimal place beyond these units. Those cases are easily identifiable by the extra digit appearing to the right of the number, in a column usually left blank.

MED - Median

CNT - Count

UQ - Upper Quartile

LQ - Lower Quartile

WORLD - WIDE SOURCES OF IONOSPHERIC DATA

THE IONOSPHERIC DATA GIVEN IN TABLES 1 TO 100 AND FIGURES 1 TO 100 WERE ASSEMBLED BY THE CENTRAL RADIO PROPAGATION LABORATORY FOR ANALYSIS, CORRELATION AND DISTRIBUTION. THE FOLLOWING ARE THE SOURCES OF THE DATA IN THIS ISSUE.

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UNITED STATES ARMY SIGNAL CORPS., UNITED STATES OF AMERICA.

ADAK, ALASKA

NATIONAL BUREAU OF STANDARDS, UNITED STATES OF AMERICA.

(CENTRAL RADIO PROPAGATION LABORATORY).

ANCHORAGE, ALASKA

BARROW, ALASKA

TALARA, PERU (INSTITUTO GEOFISICO DEL PERU)

WASHINGTON, D.C.

August 1963 - April 1959

TABLE I

HOUR		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
f6F2	MED	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
	CNT	37	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36
	LO	11	12	11	9	17	13	15	13	16	19	21	22	23	23	24	28	29	28	27	26	29	28	17	19
	LI	38	40	36	40	43	43	44	44	44	45	46	45	46	45	46	46	46	44	45	42	42	40	39	39
h'F2	MED	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
	CNT	38	32	33	30	36	36	37	39	40	43	42	42	41	43	42	43	43	42	41	39	34	34	36	31
	LO																								
	LI																								
h'F	MED	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
	CNT	32	31	32	31	31	31	31	30	29	30	28	30	30	25	31	32	31	30	31	30	30	30	30	30
	LO																								
	LI																								
f6F1	MED	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
	CNT	30	29	26	28	25	26	24	22	22	19	14	17	15	15	19	26	27	28	30	31	31	31	25	25
	LO																								
	LI																								
f6E	MED	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
	CNT	27	29	26	26	25	26	25	26	24	22	22	19	14	17	15	15	19	26	27	28	30	31	31	25
	LO																								
	LI																								
h'E	MED	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
	CNT	45	36	47	47	42	31	35	40	36	36	30	29	27	22	18	18	26	27	25	28	28	30	35	37
	LO																								
	LI																								

AUGUST, 1963

SWEEP 1.0 MC TO 25.0 MC IN 16.2 SECONDS.

JULY, 1963

TABLE 2

[illegible]

JULY, 1963

[illegible]

JULY, 1963

ADAK, ALASKA		151°39N, 176°04W												TIME 1800											
HOUR		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
foF2	MED	35	36	33	30	32	39	45	46	46	48	50	58	59	56	56	55	55	57	59	56	59	58	54	46
	CHG	35	36	33	30	32	39	45	46	46	48	50	58	59	56	56	55	55	57	59	56	59	58	54	46
	UO	40	38	36	36	38	53	49	50	52	53	51	54	54	50	49	48	48	47	49	52	58	63	58	51
	LQ	34	30	29	26	30	36	40	40	42	40	43	46	46	44	44	42	44	43	42	47	50	54	50	40
h'F2	MED																								
	CHG																								
	UO																								
	LQ																								
h'F1	MED																								
	CHG																								
	UO																								
	LQ																								
foF1	MED																								
	CHG																								
	UO																								
	LQ																								
foE	MED	318	300	295	290	290	290	295	280	285	275	255	250	260	282	278	268	305	310	312	318	315	320	320	325
	CHG	318	300	295	290	290	295	280	285	275	255	250	260	282	278	268	305	310	312	318	315	320	320	325	
	UO	318	317	316	317	329	330	324	325	326	324	326	326	326	326	326	326	326	326	326	326	326	326	326	
	LQ	300	290	290	290	290	290	290	290	290	290	290	290	290	290	290	290	290	290	290	290	290	290	290	
h'F1	MED																								
	CHG																								
	UO																								
	LQ																								
foE	MED																								
	CHG																								
	UO																								
	LQ																								
h'E	MED																								
	CHG																								
	UO																								
	LQ																								
foEs	MED	30	30	25	23	30	34	39	42	43	42	40	36	35	32	32	36	32	36	32	36	32	30	26	15
	CHG	30	30	25	23	30	34	39	42	43	42	40	36	35	32	32	36	32	36	32	36	32	30	26	15
	UO	30	30	25	23	30	34	39	42	43	42	40	36	35	32	32	36	32	36	32	36	32	30	26	15
	LQ	30	30	25	23	30	34	39	42	43	42	40	36	35	32	32	36	32	36	32	36	32	30	26	15

JULY, 1963

TABLE 6

		TALARA, PERU 1 44.65, 81.34																							TIME 75.0M			
HOUR		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23			
f6F2	MED	66	60	59	55	40	34	32	51	64	71	76	78	80	83	85	84	89	87	84	80	76	74	76	82			
	CNT	22	23	27	27	24	24	22	31	31	30	30	30	31	31	31	30	31	31	30	28	27	24	24	24			
	UQ	19	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18			
	LQ	59	55	50	45	34	30	28	46	59	69	73	74	76	76	78	80	81	83	81	78	70	69	67	74			
N F2	MED									365	395	392	410	400	355	330												
	CNT									3	15	22	26	25	21	20												
	UQ									3	15	22	26	25	21	20												
	LQ									360	410	400	355	330	300	300												
N F	MED	230	230	230	232	230	230	240	235	210	200	195	200	200	190	200	200	210	210	250	280	300	290	270	230			
	CNT	30	30	30	30	30	30	30	29	30	28	26	27	25	22	23	22	18	29	26	27	27	27	27	30			
	UQ	230	240	235	240	250	270	300	245	230	220	210	210	200	202	200	205	210	215	260	300	320	310	280	240			
	LQ	210	215	215	220	215	235	252	235	212	200	185	190	190	192	190	190	190	200	240	295	275	270	255	210			
M3000F2	MED	330	330	325	330	330	310	322	330	290	240	245	235	235	230	235	235	265	268	265	235	270	280	302	330			
	CNT	30	30	30	30	30	30	30	30	29	30	30	30	30	30	30	30	31	31	30	29	27	27	25	22			
	UQ	340	340	335	350	340	322	310	330	300	270	260	240	230	225	235	250	265	270	280	280	275	290	310	340			
	LQ	320	315	320	320	300	292	280	315	285	250	235	230	220	215	215	225	240	250	242	255	260	280	300	320			
f6F1	MED									2	450	460	450	450	430													
	CNT									2	14	23	29	25	22	14												
	UQ									195	200	330	340	350	345	315												
	LQ									23	23	27	28	29	17	16	10	12	10									
f6E	MED									122	115	111	109	109	109	109	109	109	109	109	109	109	109	109	109			
	CNT									30	31	30	31	31	31	31	29	26	20	17								
	UQ									300	310	300	300	300	300	300	300	300	300	300	300	300	300	300	300			
	LQ									300	310	300	300	300	300	300	300	300	300	300	300	300	300	300	300			
N E	MED									2	450	460	450	450	430													
	CNT									2	14	23	29	25	22	14												
	UQ									195	200	330	340	350	345	315												
	LQ									23	23	27	28	29	17	16	10	12	10									
f6Ea	MED	23	21	17	20	18	16	18	21	28	33	36	37	40	39	38	37	42	43	36	32	26	40	32	29			
	CNT	9	5	5	5	8	6	9	31	31	30	30	30	31	31	31	31	31	31	29	21	22	19	16	13			
	UQ									2	14	23	29	25	22	14												
	LQ									195	200	330	340	350	345	315												

SHEEP 1.0 MC TO 25.0 MC IN 27 SECONDS.

MAY, 1963

TABLE 8

		167.8N, 20.4E																TIME 15.0E							
HOUR		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
f6F2	MED	29	28	24	25	28	33	37	40	43	45	47	48	50	50	48	46	45	44	41	36	30	29	24	
	CNT	30	31	28	28	31	35	39	43	45	47	50	53	52	53	51	49	48	46	43	40	35	30	26	
	UQ	30	31	28	28	31	35	39	43	45	47	50	53	52	53	51	49	48	46	43	40	35	30	26	
	LQ	25	22	20	21	25	30	35	38	39	43	44	47	47	44	44	45	44	40	36	32	26	25	22	
N F2	MED									395	430	425	360	365	355	330	320	310	305	310	300	270	290		
	CNT									1	48	45	42	35	32	32	30	30	30	2					
	UQ									1	48	45	42	35	32	32	30	30	30	2					
	LQ									365	365	315	320	300	310	300	290	290	285	275	260				
N F	MED	300	295	290	295	255	240	235	220	215	210	210	205	205	210	210	210	230	235	245	250	255	260	275	290
	CNT	19	16	16	19	20	23	24	23	26	26	26	26	26	26	26	27	27	28	27	25	23	21	20	
	UQ	310	310	310	310	320	320	320	310	320	310	320	320	320	320	320	320	320	320	320	320	320	320	320	
	LQ	295	275	275	270	245	225	220	205	210	200	200	200	195	205	200	205	215	225	235	245	245	255	260	285
M3000F2	MED	300	290	290	295	255	240	235	220	215	210	205	205	210	210	210	230	235	245	250	255	260	275	290	
	CNT	4	4	4	4	6	15	21	23	22	25	28	25	26	26	26	27	27	28	27	25	23	21	20	
	UQ	310	300	300	300	320	320	320	310	320	310	320	320	320	320	320	320	320	320	320	320	320	320	320	
	LQ	290	280	280	290	260	250	240	230	220	210	205	205	210	210	210	230	235	245	250	255	260	275	290	
f6F1	MED									300	330	350	360	365	355	330	320	310	305	310	300	270	290		
	CNT									1	5	19	25	26	26	25	22	16	15	2					
	UQ									1	5	19	25	26	26	25	22	16	15	2					
	LQ									365	365	315	320	300	310	300	290	290	285	275	260				
f6E	MED									130	155	160	200	230	240	260	270	280	280	280	180	140	150		
	CNT									3	6	18	21	22	25	26	24	24	25	25	21	18	7		
	UQ									3	6	18	21	22	25	26	24	24	25	25	21	18	7		
	LQ									110	110	110	110	105	105	105	105	105	105	110	110	110			
N E	MED									1	8	14	17	21	23	22	24	24	25	26	25	23	16		
	CNT									1	8	14	17	21	23	22	24	24	25	26	25	23	16		
	UQ									1	8	14	17	21	23	22	24	24	25	26	25	23	16		
	LQ									195	200	330	340	350	345	315									
f6Ea	MED	40	30	30	20	21	12	21	23	21	25	26	25	23	25	24	25	27	28	27	28	20	35	31	44
	CNT	17	13	15	13	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	
	UQ									2	14	23	29	25	22	14									
	LQ									195	200	330	340	350	345	315									

SHEEP 0.8 MC TO 15.0 MC IN 30 SECONDS.

APRIL, 1963

TABLE 5

		138.7N, 77.1W																TIME 75.0M							
HOUR		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
f6F2	MED	34	32	28	26	23	29	37	44	48	51	52	50	50	50	51	51	53	56	57	59	53	58	50	
	UQ	28	26	23	20	17	23	29	36	42	47	50	50	50	50	51	51	53	56	57	59	53	58	50	
	LO	39	35	32	28	25	30	40	47	52	56	57	55	53	52	55	54	55	56	57	61	62	56	50	
	CNT	32	30	27	23	20	25	34	40	45	44	46	48	46	46	46	45	49	50	53	54	48	40	36	
f6F2	MED	360	330	325	330	340	415																		
	UQ	360	330	325	330	340	415																		
	LO	415	395	382	368	378	505																		
	CNT	300	302	302	295	308	345	360	350	350	332	310	300	270	240										
f6F	MED	250	265	280	270	280	250	222	215	205	200	190	190	185	200	202	205	210	210	220	235	235	240	245	250
	UQ	250	265	280	270	280	250	222	215	205	200	190	190	185	200	202	205	210	210	220	235	235	240	245	250
	LO	265	280	295	300	320	265	230	220	210	200	190	180	175	180	170	150	200	205	210	230	228	230	235	235
	CNT	242	250	250	260	265	238	212	205	200	185	180	180	180	170	150	200	205	210	230	228	230	235	235	235
M3000IF2	MED	310	310	310	310	310	310	310	310	310	310	310	310	310	310	310	310	310	310	310	310	310	310	310	
	UQ	310	310	310	310	310	310	310	310	310	310	310	310	310	310	310	310	310	310	310	310	310	310	310	
	LO	310	310	310	310	310	310	310	310	310	310	310	310	310	310	310	310	310	310	310	310	310	310	310	
	CNT	300	302	300	300	300	315	268	285	298	268	300	265	260	260	265	268	260	300	310	310	315	310	310	
f6F1	MED	CNT	130	365	400	420	430	430	430	430	430	420	410	390	340										
	UQ	CNT	130	365	400	420	430	430	430	430	430	420	410	390	340										
	LO	CNT	25	20	25	27	28	29	29	31	28	29	24	5											
	CNT	CNT	300	248	280	300																			
f6E	MED	330	330	330	315	295	265	220																	
	UQ	330	330	330	315	295	265	220																	
	LO	330	330	330	315	295	265	220																	
	CNT	6	14	11	5	4	7	7	13	17	22	21	19	1											
f6E	MED	109	105	101	101	101	101	101	101	101	101	101	101	101	101	101	101	101	101	101	101	101	101	101	
	UQ	109	105	101	101	101	101	101	101	101	101	101	101	101	101	101	101	101	101	101	101	101	101	101	
	LO	109	105	101	101	101	101	101	101	101	101	101	101	101	101	101	101	101	101	101	101	101	101	101	
	CNT	31	31	31	27	26	27	28	27	28	27	26	27	26	27	26	27	26	27	26	27	26	27	26	
f6Ea	MED	42	38	37	36	37	30	26	33	30	40	42	40	38	42	37	34	36	39	39	48	48	36	40	45
	UQ	42	38	37	36	37	30	26	33	30	40	42	40	38	42	37	34	36	39	39	48	48	36	40	45
	LO	42	38	37	36	37	30	26	33	30	40	42	40	38	42	37	34	36	39	39	48	48	36	40	45
	CNT	20	20	20	20	20	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	26	27	27	

TABLE 14

HOUR		167. ANS												TIME 30.6.01											
		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
16 F2	MED	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	CU	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	LO	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	LO	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
16 F2	MED	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	CU	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	LO	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	LO	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
16 F	MED	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	CU	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	LO	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	LO	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
163000IF2	MED	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	CU	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	LO	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	LO	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
16 F	MED	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	CU	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	LO	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	LO	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
16 E	MED	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	CU	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	LO	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	LO	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
16 E	MED	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	CU	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	LO	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	LO	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
16 E	MED	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	CU	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	LO	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	LO	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
16 E	MED	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	CU	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	LO	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	LO	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

22.0 MC IN 8 MINUTES, AUTOMATIC.

MARCH, 1963

TABLE 13

[illegible]
$$5 \text{ H}_2\text{O} + 2 \text{H}_2\text{SO}_4 + 2 \text{H}^+ \rightarrow 2 \text{H}_2\text{O} + 2 \text{H}_2\text{SO}_4 + 2 \text{H}^+ + 2 \text{H}_2\text{O} + 2 \text{H}_2\text{SO}_4 + 2 \text{H}^+$$

MARCH, 1963

TABLE 15

LULFA, SHAFEN		165, ANI, 22-11												TIME 15.										
HOOR		00	01	02	03	04	05	06	07	08	09	10	2	13	14	15	16	7	18	19	20	21	22	23
16 F2	MED CUT UO LO	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
h F2	MED CUT UO LO																							
h F	MED CUT UO LO	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47
M35000F2	MED CUT UO LO	300	310	320	330	340	350	360	370	380	390	400	410	420	430	440	450	460	470	480	490	500	510	520
16 F1	MED CUT																							
16 E	MED CUT																							
h E	MED CUT																							
16 E3	MED CUT	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45

SWEEP 0.65 MC TO 25.0 MC IN 5 MINUTES, AUTOMATIC.

MARCH, 1963

TABLE 16

[illegible]

SWEEP 0.33 MC TO 20.0 MC IN 3 MINUTES.

MARCH, 1963

TABLE 17

UPPÅLA, SWEDEN 159.38N, 17.62E																								TIME 15.00				
HOUR	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23				
f6F2	22	21	20	20	19	19	28	38	26	30	31	34	34	34	34	31	31	49	46	48	43	41	27	23				
MED	46	43	42	42	38	27	42	52	58	64	68	73	85	91	92	87	85	81	77	65	46	46	47	46				
CNT	19	17	24	25	24	20	21	20	21	21	21	21	20	20	20	20	20	20	20	20	20	20	20	20				
UO	25	23	22	22	20	21	32	41	48	53	58	63	76	81	82	76	75	75	77	77	77	75	72					
LQ	41	40	38	39	35	24	39	45	53	60	64	68	77	80	80	75	72	69	62	41	38	38	46	46				
N F2	260	260	265	265	270	280	275	275	260	260	315																	
MED	260	260	265	265	270	280	275	275	260	260	315																	
CNT	1	1	1	1	1	1	1	1	1	1	1																	
UO	300	300	300	300	300	300	300	300	300	300	315																	
LQ	270	245	250	255	260	265	270	275	280	285	290																	
N F	270	265	270	265	265	250	240	235	230	230	230																	
MED	270	265	270	265	265	250	240	235	230	230	230																	
CNT	27	29	30	30	30	30	31	31	31	31	31																	
UO	260	260	260	260	260	260	260	260	260	260	260																	
LQ	260	255	255	250	250	240	230	220	210	200	190																	
MIX0000F2	290	280	280	280	285	290	320	330	340	340	340																	
MED	290	280	280	280	285	290	320	330	340	340	340																	
CNT	27	29	29	28	28	30	31	31	31	31	31																	
UO	280	270	270	270	280	280	290	300	310	320	330																	
LQ	280	270	270	270	280	280	290	300	310	320	330																	
f6F1	367	365	360	360	360	360	360	360	360	360	360																	
MED	367	365	360	360	360	360	360	360	360	360	360																	
CNT	1	1	1	1	1	1	1	1	1	1	1																	
f6E	80	110			90	135	180	220	240	250	260																	
MED	80	110			90	135	180	220	240	250	260																	
CNT	1	1			3	27	31	29	29	30	31																	
N F	125	115			115	110	110	105	105	100	100																	
MED	125	115			115	110	110	105	105	100	100																	
CNT	1	1			1	1	1	1	1	1	1																	
f6Es	22	22	23	23	25	24	27	28	28	27	26	28																
MED	22	22	23	23	25	24	27	28	28	27	26	28																
CNT	24	24	25	25	27	28	29	30	31	31	31	31																

SWEEP 0.33 MC TO 20.0 MC IN 3 MINUTES.

MARCH, 1963

TABLE 19

CONCEPCION, CHILE (36°55'N, 73°04'W)													TIME 75.00											
HOUR	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
f6F2	46	43	42	42	38	27	42	52	58	64	68	73	85	91	92	87	85	81	77	65	46	46	47	46
MED	46	43	42	42	38	27	42	52	58	64	68	73	85	91	92	87	85	81	77	65	46	46	47	46
CNT	19	17	24	25	24	20	21	20	21	21	21	21	20	20	20	20	20	20	20	20	20	20	20	20
UO	25	23	22	22	20	21	32	41	48	53	58	63	76	81	82	76	75	75	77	77	77	77	75	72
LQ	41	40	38	39	35	24	39	45	53	60	64	68	77	80	80	75	72	69	62	41	38	38	46	46
N F2	250	260	270	280	290	300	310	320	330	340	340	340												
MED	250	260	270	280	290	300	310	320	330	340	340	340												
CNT	1	1	1	1	1	1	1	1	1	1	1													
UO	300	300	300	300	300	300	300	300	300	300	300													
LQ	270	245	250	255	260	265	270	275	280	285	290													
N F	270	265	270	265	265	250	240	235	230	230	230													
MED	270	265	270	265	265	250	240	235	230	230	230													
CNT	27	29	30	30	30	30	31	31	31	31	31													
UO	260	260	260	260	260	260	260	260	260	260	260													
LQ	260	255	255	250	250	240	230	220	210	200	190													
MIX0000F2	300	292	310	330	350	315	340	360	350	340	340													
MED	300	292	310	330	350	315	340	360	350	340	340													
CNT	19	16	23	24	23	24	26	27	26	26	26													
UO	280	280	280	280	280	280	280	280	280	280	280													
LQ	280	280	280	280	280	280	280	280	280	280	280													
f6F1	367	365	360	360	360	360	360	360	360	360	360													
MED	367	365	360	360	360	360	360	360	360	360	360													
CNT	1	1	1	1	1	1	1	1	1	1	1													
f6E	80	110			90	135	180	220	240	250	260													
MED	80	110			90	135	180	220	240	250	260													
CNT	1	1			3	27	31	29	29	30	31													
N F	125	115			115	110	110	105	105	100	100													
MED	125	115			115	110	110	105	105	100	100													
CNT	1	1			1	1	1	1	1	1	1													
f6Es	22	22	23	23	25	24	27	28	28	27	26	28												
MED	22	22	23	23	25	24	27	28	28	27	26	28												
CNT	24	24	25	25	27	28	29	30	31	31	31	31												

SWEEP 1.0 MC TO 25.0 MC IN 31.5 SECONDS.

MARCH, 1963

TABLE 18

DOUBREUX, BELGIUM																								150°3N, 4°46E					TIME				
HOUR	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23									
f6F2	MED	39	37	32	27	26	24	24	26	28	31	34	37	37	37	38	38	34	29	24	21	19	17	11									
	CNT	25	25	34	34	33	26	38	40	51	57	59	61	62	61	60	58	56	50	45	36	31	27	21									
	UO	29	29	28	33	26	22	30	40	44	50	51	54	55	54	53	52	47	41	38	40	42	36	28									
	LQ	41	40	38	39	35	24	39	45	53	60	64	68	77	80	80	75	72	69	62	41	38	38	46									
N F2	MED	260	260	265	265	270	280	275	275	260	260	315																					
	CNT	260	260	265	265	270	280	275	275	260	260	315																					
	UO	260	260	265	265	270	280	275	275	260	260	315																					
	LQ	41	40	38	39	35	24	39	45	53	60	64	68	77	80	80	75	72	69	62	41	38	38	46									
N F	MED	295	290	290	287	277	250	250	235	220	210	215	215	210	208	207	204	205	204	205	204	205	202	202									
	CNT	295	290	290	287	277	250	250	235	220	210	215	215	210	208	207	204	205	204	205	204	205	202	202									
	UO	300	300	299	294	289	265	260	240	230	220	220	222	222	222	220	216	215	214	215	214	215	212	212									
	LQ	278	282	285	280	262	244	240	230	215	210	205	205	200	215	210	205	200	200	200	200	200	200	200									
IM3000F2	MED	294	294	294	294	303	304	332	351	350	352	360	332	333	333	335	338	338	338	338	338	338	338	338									
	CNT	294	294	294	294	303	304	332	351	350	352	360	332	333	333	335	338	338	338	338	338	338	338	338									
	UO	300	300	300	302	308	323	360	362	364	351	345	345	345	345	345	345	345	344	343	343	343	343										
	LQ	285	279	286	288	294	304	324	341	332	338	321	325	320	328	328	331	328	338	338	338	338	338										
f6F1	MED	190	308	367	380	400	415	412	408	370	370	370	370	370	370	370	370	370	370	370	370	370	370										
	CNT	190	308	367	380	400	415	412	408	370	370	370	370	370	370	370	370	370	370	370	370	370	370										
	UO	190	308	367	380	400	415	412	408	370	370	370	370	370	370	370	370	370	370	370	370	370	370										
	LQ	190	308	367	380	400	415	412	408	370	370	370	370	370	370	370	370	370	370	370	370	370	370										
f6E	MED	116	180	230	240	260	260	260	260	260	260	260	260	260	260	260	260	260	260	260	260	260	260										
	CNT	116	180	230	240	260	260	260	260	260	260	260	260	260	260	260	260	260	260	260	260	260	260										
	UO	116	180	230	240	260	260	260	260	260	260	260	260	260	260	260	260	260	260	260	260	260	260										
	LQ	116	180	230	240	260	260	260	260	260	260	260	260	260	260	260	260	260	260	260	260	260	260										
N E	MED	121	118	115	114	114	113	114	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115										
	CNT	121	118	115	114	114	113	114	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115										
	UO	121	118	115	114	114	113	114	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115										
	LQ	121	118	115	114	114	113	114	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115										
f6Es	MED	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29										
	CNT	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29										
	UO	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29										
	LQ	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29										

TABLE 25

(51.5N, 0.6W)

SLOUGH, ENGLAND

[illegible]

SWEEP 0.67 MC TO 25.0 MC IN 5 MINUTES, AUTOMATIC.

JANUARY, 1963

TABLE 27

$$1.6 \leq \gamma \leq 1.65, \quad \gamma_{\text{exp}} = 1.65$$

WAKKANAI, JAPAN

[illegible]

SWEEP 1.0 MC TO 10.0 MHz

100

TABLE 26

146.6N, 6.7E)

SOTTENS, SWITZERLAND

[illegible]

SWEEP 1.0 MC TO 25.0 MC IN 30 SECONDS.

JANUARY, 1963

TABLE 20

139.74. 140.18:

AITA, JAPAN

[illegible]

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TABLE 38

JOHANNESBURG, UNION OF S. AFRICA (26+15, 28+1E)													TIME 135.00											
HOUR	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
16F2	MED	44	42	39	35	32	35	48	56	66	72	80	84	84	81	83	81	79	76	71	66	58	49	44
16F1	MED	28	28	28	28	28	28	28	28	28	28	28	28	28	28	29	29	29	29	29	29	29	29	29
16E	MED	28	28	28	28	28	28	28	28	28	28	28	28	28	28	29	29	29	29	29	29	29	29	29
16E+	MED	28	28	28	28	28	28	28	28	28	28	28	28	28	28	29	29	29	29	29	29	29	29	29

DECEMBER, 1962

SWEEP 1.0 MC TO 20.0 MC IN 20 SECONDS.

TABLE 40

JOHANNESBURG, UNION OF S. AFRICA (26+15, 28+1E)													TIME 135.00											
HOUR	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
16F2	MED	44	42	39	35	32	35	48	56	66	72	80	84	84	81	83	81	79	76	71	66	58	49	44
16F1	MED	28	28	28	28	28	28	28	28	28	28	28	28	28	28	29	29	29	29	29	29	29	29	29
16E	MED	28	28	28	28	28	28	28	28	28	28	28	28	28	28	29	29	29	29	29	29	29	29	29
16E+	MED	28	28	28	28	28	28	28	28	28	28	28	28	28	28	29	29	29	29	29	29	29	29	29

DECEMBER, 1962

SWEEP 1.0 MC TO 15.0 MC IN 1 MINUTE 30 SECONDS.

TABLE 37

YANAGAWA, JAPAN (31+2N, 130+6E)																								TIME 135.00
HOUR	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
16F2	MED	44	42	39	35	32	35	48	56	66	72	80	84	84	81	83	81	79	76	71	66	58	49	44
16F1	MED	28	28	28	28	28	28	28	28	28	28	28	28	28	28	29	29	29	29	29	29	29	29	29
16E	MED	28	28	28	28	28	28	28	28	28	28	28	28	28	28	29	29	29	29	29	29	29	29	29
16E+	MED	28	28	28	28	28	28	28	28	28	28	28	28	28	28	29	29	29	29	29	29	29	29	29

DECEMBER, 1962

SWEEP 1.0 MC TO 20.0 MC IN 20 SECONDS.

TABLE 39

YANAGAWA, JAPAN (31+2N, 130+6E)																							TIME 135.00	
HOUR	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
16F2	MED	44	42	39	35	32	35	48	56	66	72	80	84	84	81	83	81	79	76	71	66	58	49	44
16F1	MED	28	28	28	28	28	28	28	28	28	28	28	28	28	28	29	29	29	29	29	29	29	29	29
16E	MED	28	28	28	28	28	28	28	28	28	28	28	28	28	28	29	29	29	29	29	29	29	29	29
16E+	MED	28	28	28	28	28	28	28	28	28	28	28	28	28	28	29	29	29	29	29	29	29	29	29

DECEMBER, 1962

SWEEP 1.0 MC TO 20.0 MC IN 20 SECONDS.

TABLE 41

ZEPHYRUS, UNION OF S. AFRICA

(15.2.57.54.5)

HOUR	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
10F2	MED CNT LO	3.4 2.8 2.8	3.4 2.8 2.8	3.4 2.8 2.8	3.4 2.8 2.8	3.4 2.8 2.8	3.4 2.8 2.8	3.4 2.8 2.8	3.4 2.8 2.8	3.4 2.8 2.8	3.4 2.8 2.8	3.4 2.8 2.8	3.4 2.8 2.8	3.4 2.8 2.8	3.4 2.8 2.8	3.4 2.8 2.8	3.4 2.8 2.8	3.4 2.8 2.8	3.4 2.8 2.8	3.4 2.8 2.8	3.4 2.8 2.8	3.4 2.8 2.8	3.4 2.8 2.8	3.4 2.8 2.8
10F2	MED CNT LO																							
10F	MED CNT LO																							
M100001F2	MED CNT LO																							
10F1	MED CNT																							
10E	MED CNT																							
10E	MED CNT																							
10Ea	MED CNT																							

SPEED 1.0 MC TO 15.0 MC IN 1.0 MINUTE. 1962

DECEMBER 1962

TABLE 42

PORT STANLEY (AUSTRALIA)

(15.2.57.54.5)

HOUR	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
10F2	MED CNT LO	3.4 2.8 2.8	3.4 2.8 2.8	3.4 2.8 2.8	3.4 2.8 2.8	3.4 2.8 2.8	3.4 2.8 2.8	3.4 2.8 2.8	3.4 2.8 2.8	3.4 2.8 2.8	3.4 2.8 2.8	3.4 2.8 2.8	3.4 2.8 2.8	3.4 2.8 2.8	3.4 2.8 2.8	3.4 2.8 2.8	3.4 2.8 2.8	3.4 2.8 2.8	3.4 2.8 2.8	3.4 2.8 2.8	3.4 2.8 2.8	3.4 2.8 2.8	3.4 2.8 2.8	3.4 2.8 2.8
10F2	MED CNT LO																							
10F	MED CNT LO																							
M100001F2	MED CNT LO																							
10F	MED CNT																							
10E	MED CNT																							
10E	MED CNT																							
10Ea	MED CNT																							

SPEED 1.0 MC TO 15.0 MC IN 1.0 MINUTE. 1962

DECEMBER 1962

TABLE 44

PORT STANLEY (AUSTRALIA)

(15.2.57.54.5)

HOUR	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
10F2	MED CNT LO																							
10F2	MED CNT LO																							
10F	MED CNT LO																							
M100001F2	MED CNT LO																							
10F	MED CNT																							
10E	MED CNT																							
10E	MED CNT																							
10Ea	MED CNT																							

SPEED 1.0 MC TO 15.0 MC IN 1.0 MINUTE. 1962

DECEMBER 1962

TABLE 49
BAROTONGA, COOK IS.
(21, 25, 159, 8W)

[illegible]
$$0.13 \text{ m}^2, \quad m = 1.2 \times 10^{-2} \text{ m}^2, \quad \text{Vol} = 0.17 \text{ m}^3.$$

1998, 1999, 2000

TABLE 50

WARSAW (WIEDZESZYN), POLAND

192.2N, 21.2E

hour		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
f6 F2	MED	33	31	30	30	29	28	27	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11
	CNT	22	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	0	0
	Q1	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2
	LO	35	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10
h' F2	MED	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7
	CNT	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	0	0	0
	Q1	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
	LO	30	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5
h' F	MED	33	30	30	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10
	CNT	24	24	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3
	Q1	27	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3
	LO	35	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10
f6 F1	MED	33	30	30	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10
	CNT	24	24	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3
	Q1	27	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3
	LO	35	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10
f6 E	MED	33	30	30	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10
	CNT	24	24	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3
	Q1	27	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3
	LO	35	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10

SWEEP 1.0 MC TO 10.0 MC IN 20 SECONDS.

SEPTEMBER, 1962

$$\frac{d}{dt} \left(\frac{\partial L}{\partial \dot{x}} \right) = \frac{\partial L}{\partial x}$$
[illegible]

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$$|BA \cap \Delta_{N_1}| = 1, \quad |7 \cup \Delta_{N_1}| = 2, \quad |7 \cap \Delta_{N_1}| = 1, \quad |BA \cap \Delta_{N_2}| = 1, \quad |7 \cap \Delta_{N_2}| = 2, \quad |7 \cap \Delta_{N_2}| = 1.$$

	Hour	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
FoF2	MED	82	80	77	74	76	78	74	68	64	64	64	60	52	48	47	40	35	35	32	38	38	34	31	26
	UO	82	80	77	74	76	78	74	68	64	64	64	60	52	48	47	40	35	35	32	38	38	34	31	26
	LO	82	80	77	74	76	78	74	68	64	64	64	60	52	48	47	40	35	35	32	38	38	34	31	26
N'F2	MED																								
	UO																								
	LO																								
N'F	MED	75	76	76	75	73	76	78	74	70	67	65	60	53	51	50	43	38	38	30	30	30	28	24	20
	UO	75	76	76	75	73	76	78	74	70	67	65	60	53	51	50	43	38	38	30	30	30	28	24	20
	LO	75	76	76	75	73	76	78	74	70	67	65	60	53	51	50	43	38	38	30	30	30	28	24	20
M3000F2	MED	81	83	84	86	87	87	84	80	75	68	62	56	48	44	43	36	30	28	24	24	26	26	20	16
	UO	81	83	84	86	87	87	84	80	75	68	62	56	48	44	43	36	30	28	24	24	26	26	20	16
	LO	81	83	84	86	87	87	84	80	75	68	62	56	48	44	43	36	30	28	24	24	26	26	20	16
FoF1	MED																								
	UO																								
	LO																								
FoE	MED																								
	UO																								
	LO																								
N'E	MED																								
	UO																								
	LO																								
FoE4	MED	14	12	14	14	12	14	14	13	12	10	10	9	8	7	7	6	5	4	4	4	4	4	4	4
	UO	14	12	14	14	12	14	14	13	12	10	10	9	8	7	7	6	5	4	4	4	4	4	4	4
	LO	14	12	14	14	12	14	14	13	12	10	10	9	8	7	7	6	5	4	4	4	4	4	4	4

SPEED 0-67 MC TO 25.0 MC IN 5 MINUTES. AUTOMATIC.

13
SEPTEMBER, 1962

TABLE 6.
MARSA MIEDZESZYNA, POLAND
1522Hr, 21-22

TIME 15.00	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
16F2	MED CNT UO LO																							
16F2	MED CNT UO LO																							
16F	MED CNT UO LO																							
MIS000IF2	MED CNT UO LO																							
16F1	MED CNT																							
16E	MED CNT																							
16E	MED CNT																							
16Ea	MED CNT																							

SWEET 1.0 MC TO 10.0 MC IN 20 SECONDS.

AUGUST, 1962

TABLE 6.
BUENOS AIRES, ARGENTINA
(154.55, 58.54)

TIME 05.00	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
16F2	MED CNT UO LO																							
16F2	MED CNT UO LO																							
16F	MED CNT UO LO																							
MIS000IF2	MED CNT UO LO																							
16F1	MED CNT																							
16E	MED CNT																							
16E	MED CNT																							
16Ea	MED CNT																							

SWEET 1.0 MC TO 25.0 MC IN 27 SECONDS.

SEPTEMBER, 1962

TABLE 6.
BUENOS AIRES, ARGENTINA
(154.55, 58.54)

TIME 05.00	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
16F2	MED CNT UO LO																							
16F2	MED CNT UO LO																							
16F	MED CNT UO LO																							
MIS000IF2	MED CNT UO LO																							
16F1	MED CNT																							
16E	MED CNT																							
16E	MED CNT																							
16Ea	MED CNT																							

SWEET 0.67 MC TO 25.0 MC IN 5 MINUTES, AUTOMATIC.

AUGUST, 1962

TABLE 6.
BUENOS AIRES, ARGENTINA
(154.55, 58.54)

TIME 15.00	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
16F2	MED CNT UO LO																							
16F2	MED CNT UO LO																							
16F	MED CNT UO LO																							
MIS000IF2	MED CNT UO LO																							
16F1	MED CNT																							
16E	MED CNT																							
16E	MED CNT																							
16Ea	MED CNT																							

SWEET 1.0 MC TO 10.0 MC IN 6 MINUTES.

AUGUST, 1962

TABLE 57
BUENOS AIRES, ARGENTINA (34°25', 58.3W)

HOUR	TIME 60.0W											
	00	01	02	03	04	05	06	07	08	09	10	11
f _o F ₂	30	30	30	34	31	26	26	68	58	50	76	33
MUF	23	23	22	23	21	12	10	21	20	21	16	22
QY												
QZ												
QX												
QW												
QV												
QU												
Q												
N _o F ₂												
M3000F ₂												
f _o F ₁												
f _o E												
N _o E												
f _o E _s												

SHEEP 1.0 MC TO 25.0 MC IN 27 SECONDS.

AUGUST, 1962

TABLE 58
WARSAW (MIEDZYZYM), POLAND (52°20', 21°2E)

HOUR	TIME 15.0E											
	00	01	02	03	04	05	06	07	08	09	10	11
f _o F ₂	45	41	39	37	42	45	48	50	51	56	56	56
MUF	27	26	27	27	29	29	33	33	35	38	38	38
QY												
QZ												
QX												
QW												
QV												
QU												
Q												
N _o F ₂												
M3000F ₂												
f _o F ₁												
f _o E												
N _o E												
f _o E _s												

SHEEP 1.0 MC TO 18.0 MC IN 20 SECONDS.

JULY, 1962

TABLE 59
IBADANA, NIGERIA (7°44'N, 3°40'E)

HOUR	TIME 0.0											
	00	01	02	03	04	05	06	07	08	09	10	11
f _o F ₂	47	36	34	32	28	23	20	17	15	14	12	11
MUF	21	20	21	21	20	19	18	17	16	15	14	13
QY												
QZ												
QX												
QW												
QV												
QU												
Q												
N _o F ₂												
M3000F ₂												
f _o F ₁												
f _o E												
N _o E												
f _o E _s												

SHEEP 0.67 MC TO 25.0 MC IN 5 MINUTES, AUTOMATIC.

JULY, 1962

TABLE 60
TOMESVILLE, AUSTRALIA (17°35', 146°27'E)

HOUR	TIME 150.0E											
	00	01	02	03	04	05	06	07	08	09	10	11
f _o F ₂	33	34	32	32	28	27	28	44	56	62	64	60
MUF	14	14	12	12	10	10	11	13	13	13	13	12
QY												
QZ												
QX												
QW												
QV												
QU												
Q												
N _o F ₂												
M3000F ₂												
f _o F ₁												
f _o E												
N _o E												
f _o E _s												

SHEEP 1.0 MC TO 25.0 MC IN 30 SECONDS.

JULY, 1962

TIME	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
16F2	MED CNT LO																							
16F2	MED CNT LO																							
16F	MED CNT LO																							
16F	MED CNT LO																							
16E	MED CNT LO																							
16E	MED CNT LO																							
16E	MED CNT LO																							
16E	MED CNT LO																							

APRIL 1962

TIME	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
16F2	MED CNT LO																							
16F2	MED CNT LO																							
16F	MED CNT LO																							
16F	MED CNT LO																							
16E	MED CNT LO																							
16E	MED CNT LO																							
16E	MED CNT LO																							
16E	MED CNT LO																							

DECEMBER 1961

TIME	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
16F2	MED CNT LO																							
16F2	MED CNT LO																							
16F	MED CNT LO																							
16F	MED CNT LO																							
16E	MED CNT LO																							
16E	MED CNT LO																							
16E	MED CNT LO																							
16E	MED CNT LO																							

JULY 1962

TIME	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
16F2	MED CNT LO																							
16F2	MED CNT LO																							
16F	MED CNT LO																							
16F	MED CNT LO																							
16E	MED CNT LO																							
16E	MED CNT LO																							
16E	MED CNT LO																							
16E	MED CNT LO																							

JANUARY 1962

CONCEPCIÓN, CHILE
(36.65, 73.0W)
TABLE 65

[illegible]

SWEEP 1.0 MC TO 25.0 MC IN 31.5 SECONDS*

DECEMBER, 1961

TABLE 67

[illegible][illegible]

NOVEMBER 1961

TROMSØ, NORWAY
(69° 7N, 19° 5E)

[illegible]

SWEEP 0.7 MC TO 25.0 MC IN 5 MINUTES, AUTOMATIC.

NOVEMBER, 1961

CONCEPCION, CHILE
1964-65, 73-74)

[illegible][illegible]

00730253 1964

[illegible]

СОВЕТСКОЕ ЛОД:

[illegible]

JULY, 1961

[illegible]

КЕРПРЧМАФР, 1961

[illegible] $\Delta \leq T, \quad \gamma_A$

Sheet 1 of 1		Date: 05/11/2014		Time: 10:00																					
Hour		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
to F2	MED CMT LO	1.1	1.4	1.7	2.0	2.3	2.6	2.9	3.2	3.5	3.8	4.1	4.4	4.7	5.0	5.3	5.6	5.9	6.2	6.5	6.8	7.1	7.4	7.7	8.0
n F2	MED CMT LO																								
n F	MED CMT LO	1.6	1.9	2.2	2.5	2.8	3.1	3.4	3.7	4.0	4.3	4.6	4.9	5.2	5.5	5.8	6.1	6.4	6.7	7.0	7.3	7.6	7.9	8.2	8.5
M3000IF2	MED CMT LO	1.6	1.9	2.2	2.5	2.8	3.1	3.4	3.7	4.0	4.3	4.6	4.9	5.2	5.5	5.8	6.1	6.4	6.7	7.0	7.3	7.6	7.9	8.2	8.5
to F1	MED CMT																								
to E	MED CMT																								
n'E	MED CMT																								
to Ea	MED CMT																								

SWEEP 0.67 MC TO 25.0 MC IN 4 MINUTES. AUTOMATIC.

[illegible]MARCH, 1960[illegible]

SWEEP 1-4 MC TO 20.0 MC IN 60 SECONDS.

[illegible]1991-1992

400

1. AgCl 0.0

PROF. F.W. ARGENTINA

0.0000

[illegible]

SWEEP 1.3 MC TO 18.0 MC IN 30 SECONDS.

МАРЧ, 1960

TABLE 85

\mathcal{L}	$\mathcal{L} \cap \mathcal{L}_0$	$\mathcal{L} \cap \mathcal{L}_1$	$\mathcal{L} \cap \mathcal{L}_2$
\mathcal{L}_0	\mathcal{L}_0	\mathcal{L}_0	\mathcal{L}_0
\mathcal{L}_1	\mathcal{L}_0	\mathcal{L}_1	\mathcal{L}_1
\mathcal{L}_2	\mathcal{L}_0	\mathcal{L}_1	\mathcal{L}_2

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[illegible]

SWEEP 1-4 MC TO 20-0 MC IN 40 SECONDS.

1961. 1960.

TABLE 87

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[illegible]

SWEEP 1.4 MC TO 20.0 MC IN 40 SECONDS.

[illegible]

TABLE 89

147.25, 65.341

TREW, ARGENTINA

[illegible]

SWEEP 1.3 MC TO 18.0 MC IN 30 SECONDS.

FEBRUARY, 1960

YAGC 91

1.34. 103.96,

SINGAPORE, BRITISH MALAYA

[illegible]

SWEEP 0.67 MC TO 25.0 MC IN 5 MINUTES, AUTOMATIC.

1954

TABLE 90

157.4N, 26.6E)

SODANKYLÄ, FINLAND

[illegible]

$\leq \max\{t_0, t_1, t_2, t_3, t_4\} + M_C T_{\text{min}} + M_C T_{\text{min}} + A + T_{\text{DMA}} + T_c$.

JANUARY, 1960

YAGI - 32

[illegible]

TDFLFW, AGRICULTURE

[illegible]

Time: 3 MC TO 18.0 MC IN 10 SECONDS.

JANUARY, 1960

HOUR	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
to F2	MED CNT UQ LO																							
to F1	MED CNT UQ LO																							
to F	MED CNT UQ LO																							
M3000IF2	MED CNT UQ LO	255	250	230	235	240																		
to F1	MED CNT UQ LO																							
to E	MED CNT UQ LO																							
to E	MED CNT UQ LO																							
to E4	MED CNT UQ LO																							

JANUARY, 1950

SWEEP 1.0 MC TO 20.0 MC IN 35 SECONDS.

HOUR	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
to F2	MED CNT UQ LO																							
to F1	MED CNT UQ LO																							
to F	MED CNT UQ LO																							
M3000IF2	MED CNT UQ LO																							
to F1	MED CNT UQ LO																							
to E	MED CNT UQ LO																							
to E	MED CNT UQ LO																							
to E4	MED CNT UQ LO																							

SWEEP 1.0 MC TO 18.0 MC IN 30 SECONDS.

OCTOBER, 1950

HOUR	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
to F2	MED CNT UQ LO																							
to F1	MED CNT UQ LO																							
to F	MED CNT UQ LO																							
M3000IF2	MED CNT UQ LO																							
to F1	MED CNT UQ LO																							
to E	MED CNT UQ LO																							
to E	MED CNT UQ LO																							
to E4	MED CNT UQ LO																							

SWEEP 1.0 MC TO 20.0 MC IN 35 SECONDS.

JULY, 1950

HOUR	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
to F2	MED CNT UQ LO																							
to F1	MED CNT UQ LO																							
to F	MED CNT UQ LO																							
M3000IF2	MED CNT UQ LO																							
to F1	MED CNT UQ LO																							
to E	MED CNT UQ LO																							
to E	MED CNT UQ LO																							
to E4	MED CNT UQ LO																							

SWEEP 1.0 MC TO 17.0 MC.

JULY, 1950

[illegible]
$$-W^k + C = 0, \quad \forall k \in \mathbb{N}, \quad \forall C \in \mathbb{R}.$$

MAY, 1960

[illegible]

SWEEP 1.2 MC TO 17.0 MC.

JULY, 1959

[illegible]

SWEEP 1.25 MC TO 20.0 MC.

10

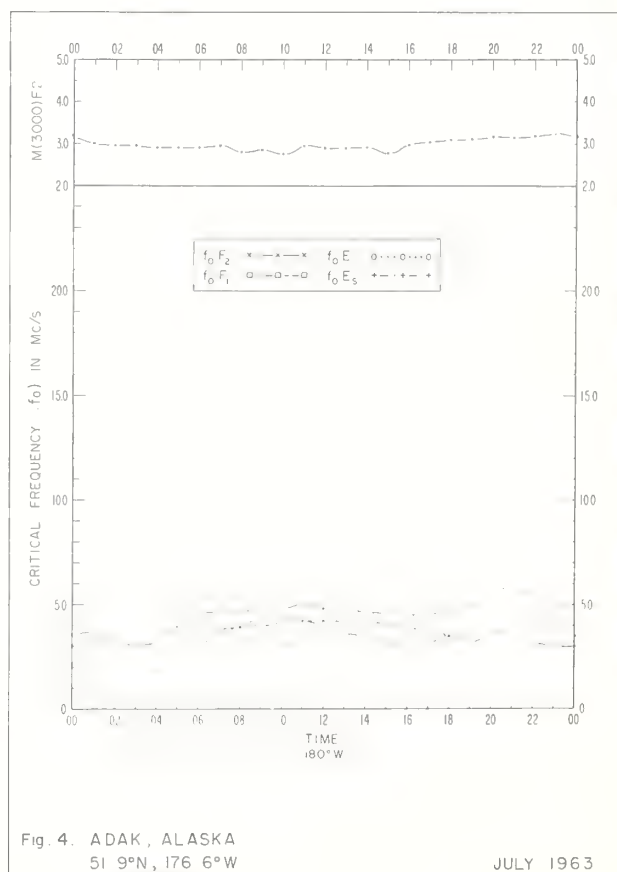
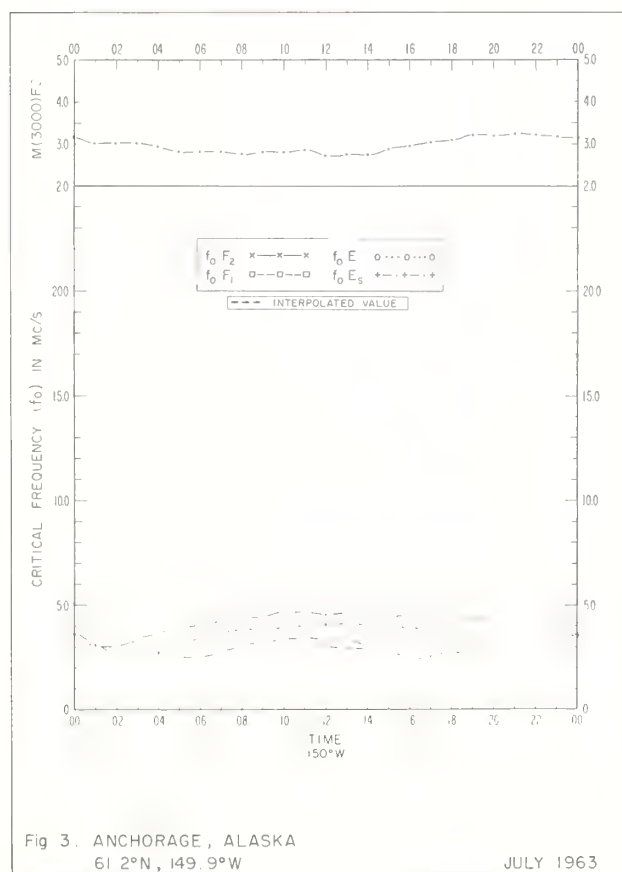
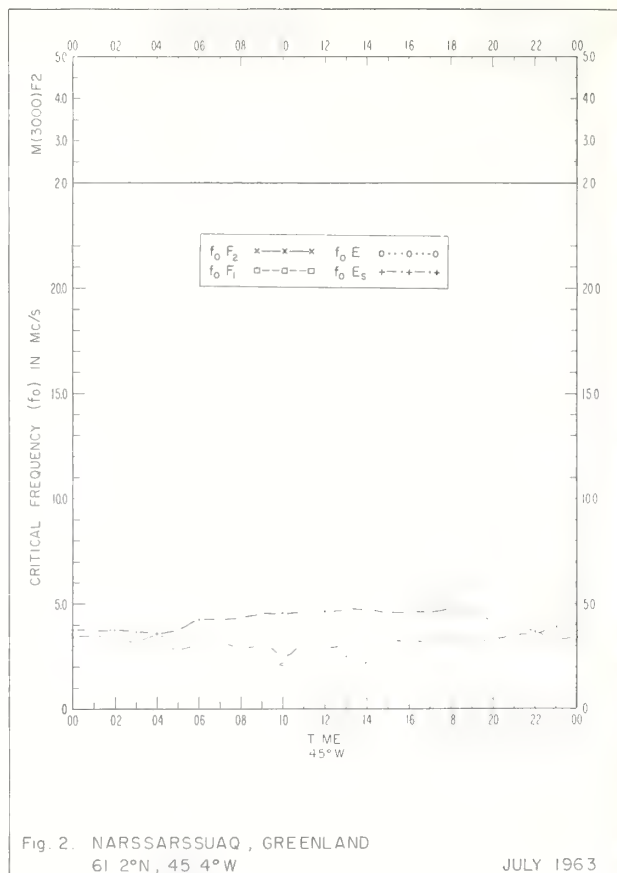
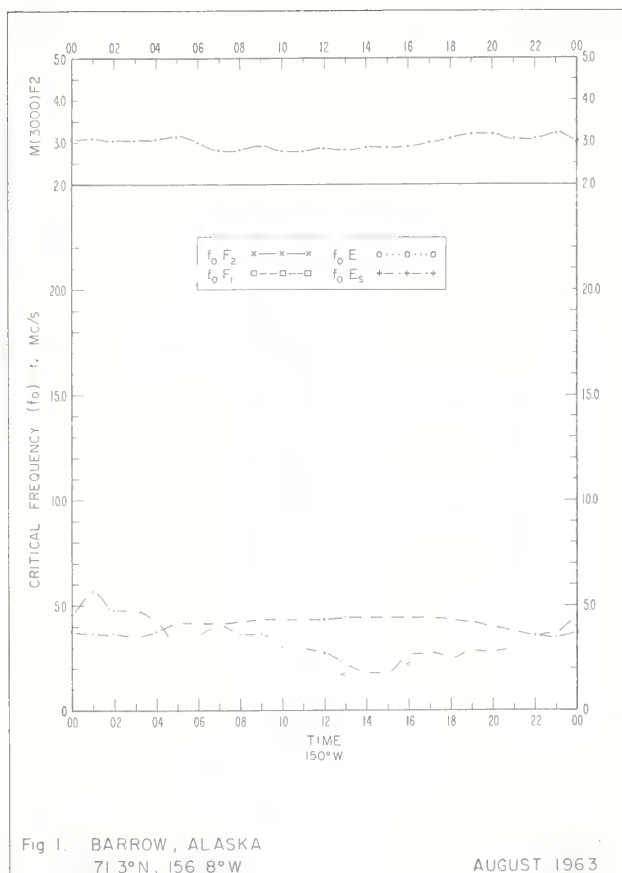
[illegible]

SWEEP 1.0 u TO 25.0 MC IN 15 SECONDS.

APRIL, 1959

*ENGINE ROOM DESTROYED BY FIRE. NO DATA FROM APRIL 3 TO 18, INCLUSIVE, A DEFICIENCY OF EQUIPMENT FAILURE OTHER PARTS OF THE MONTH.

JISCOMH-NBS-BL



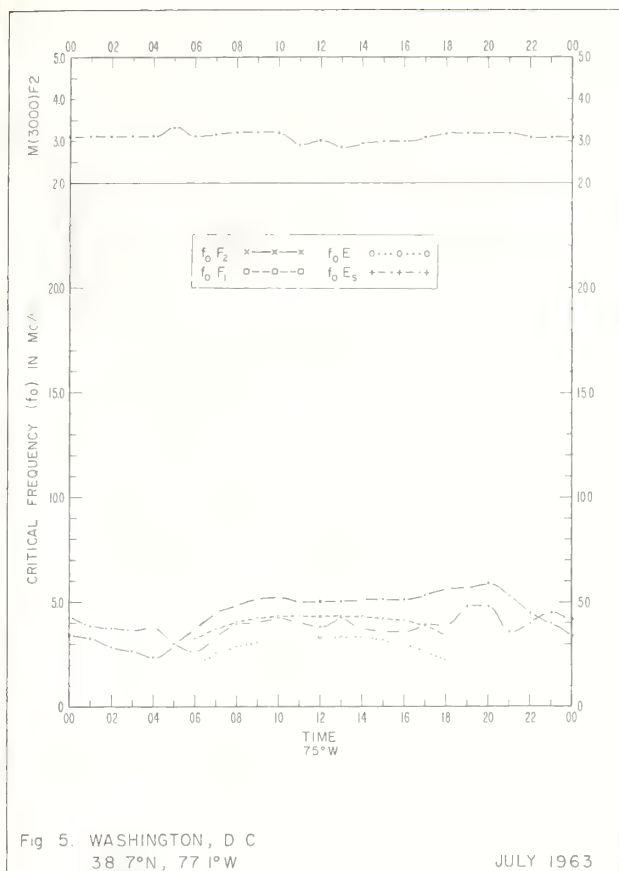


Fig 5. WASHINGTON, D C
38 7°N, 77 1°W

JULY 1963

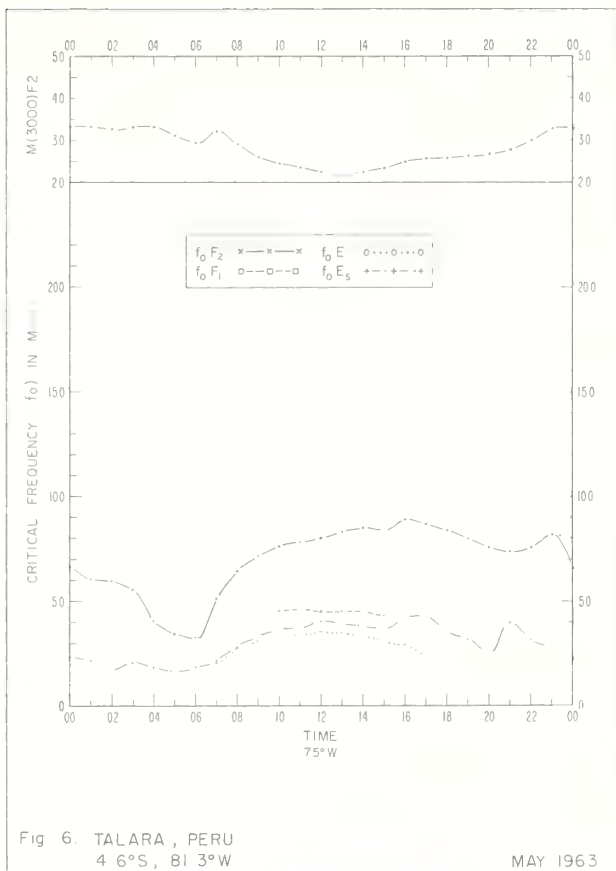


Fig 6. TALARA, PERU
4 6°S, 81 3°W

MAY 1963

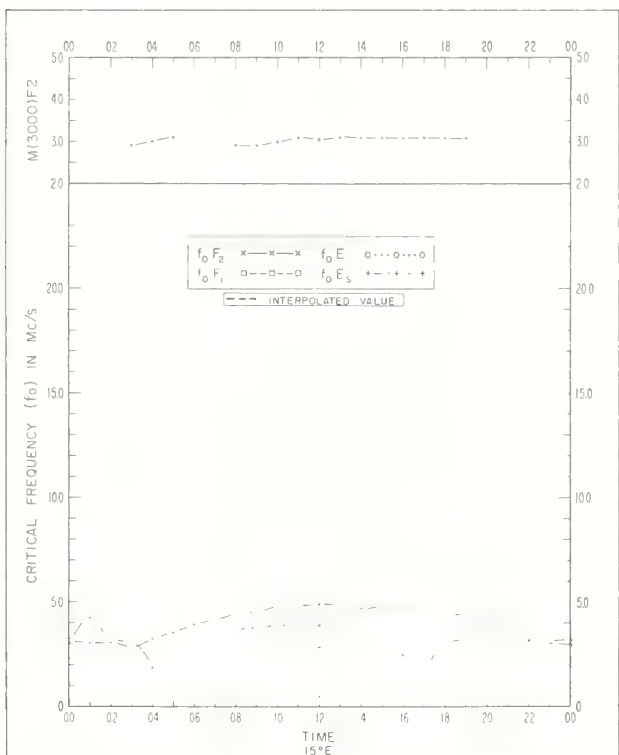


Fig. 7. TROMSØ, NORWAY
69 7°N, 19 0°E

APRIL 1963

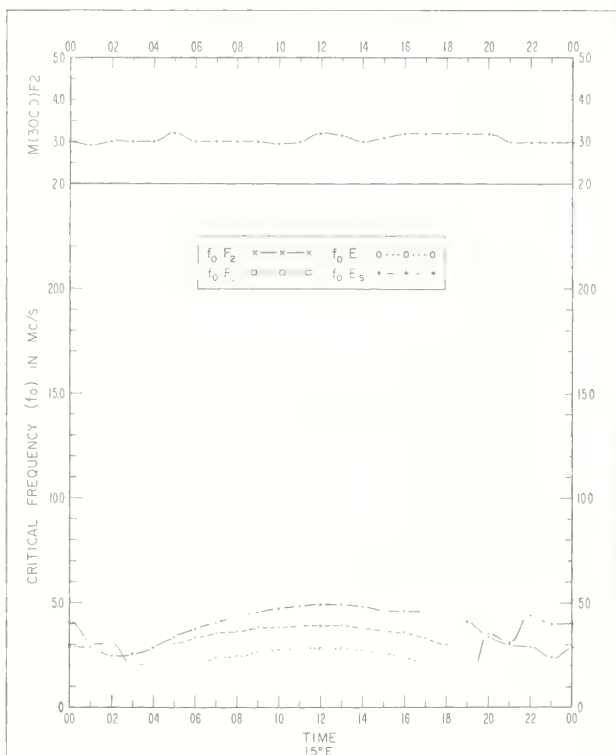
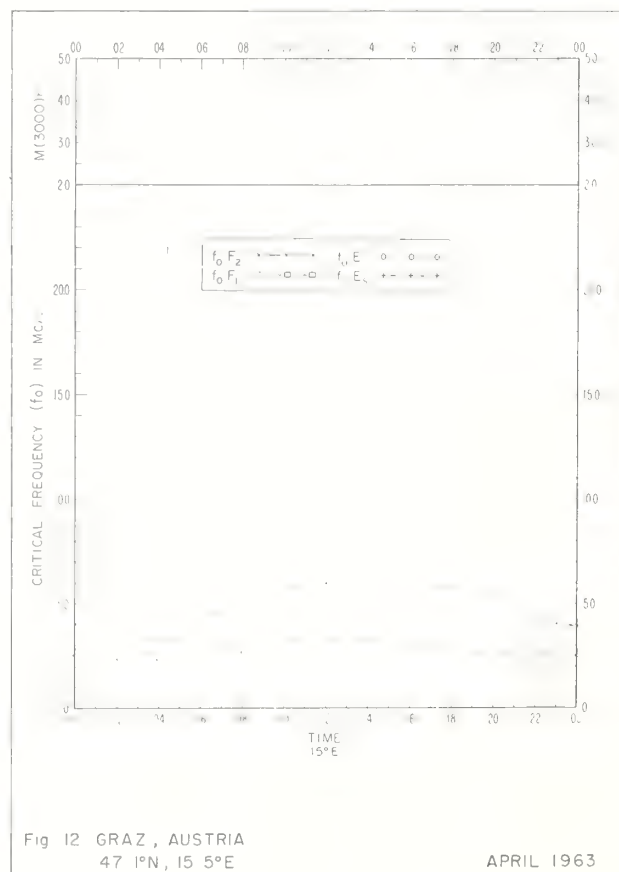
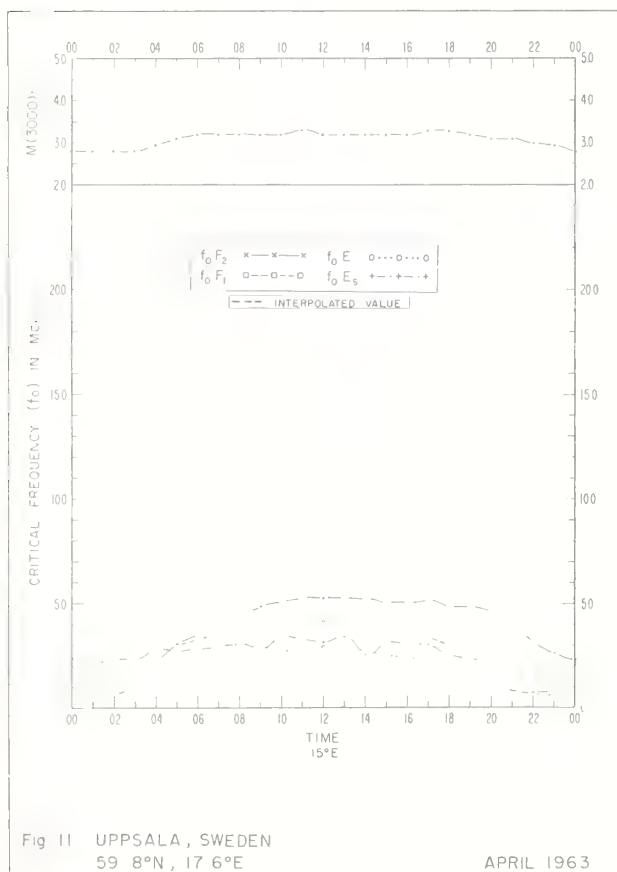
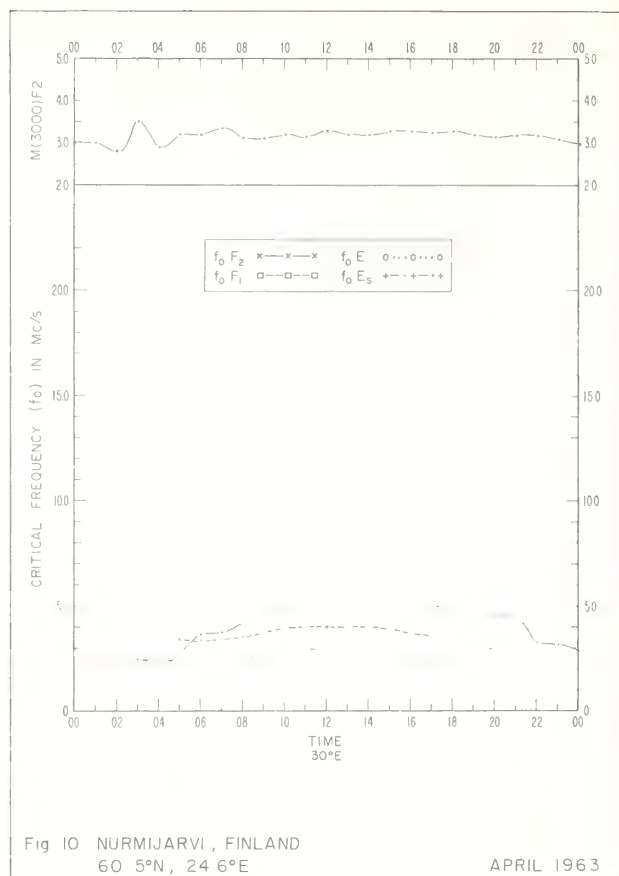
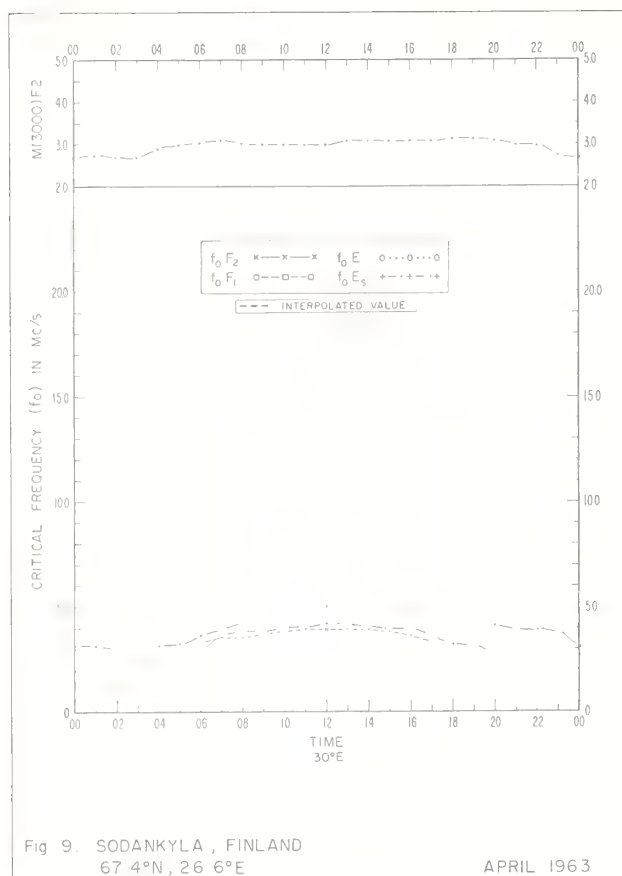
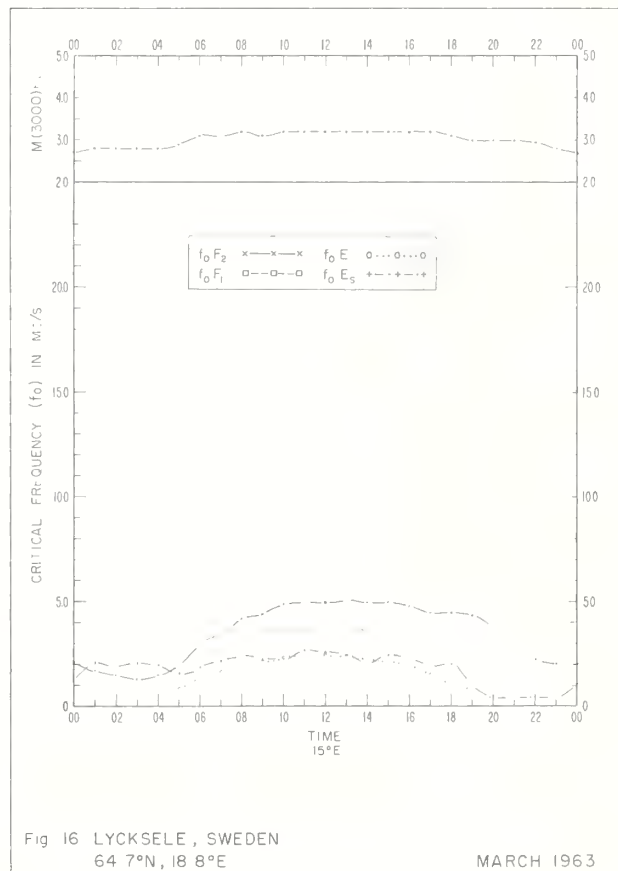
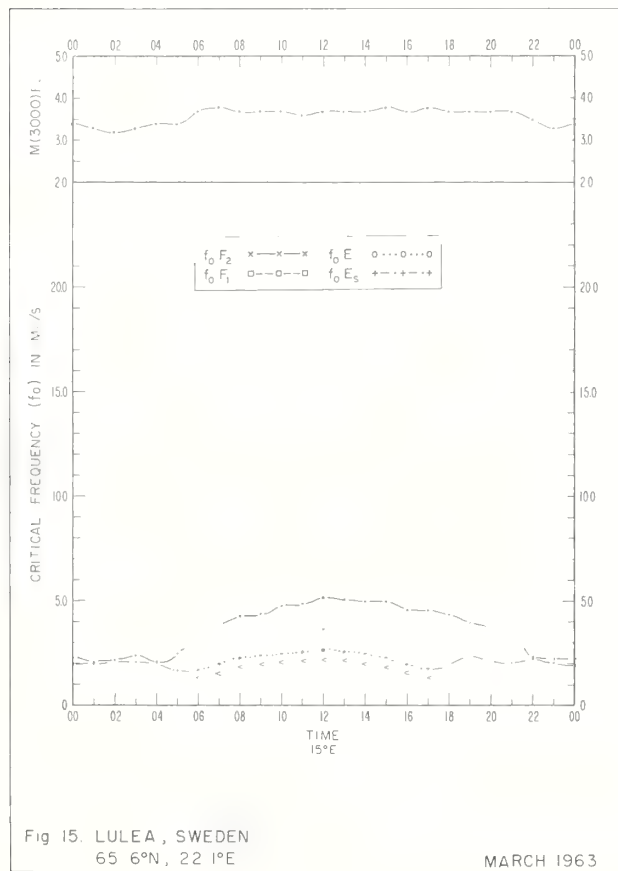
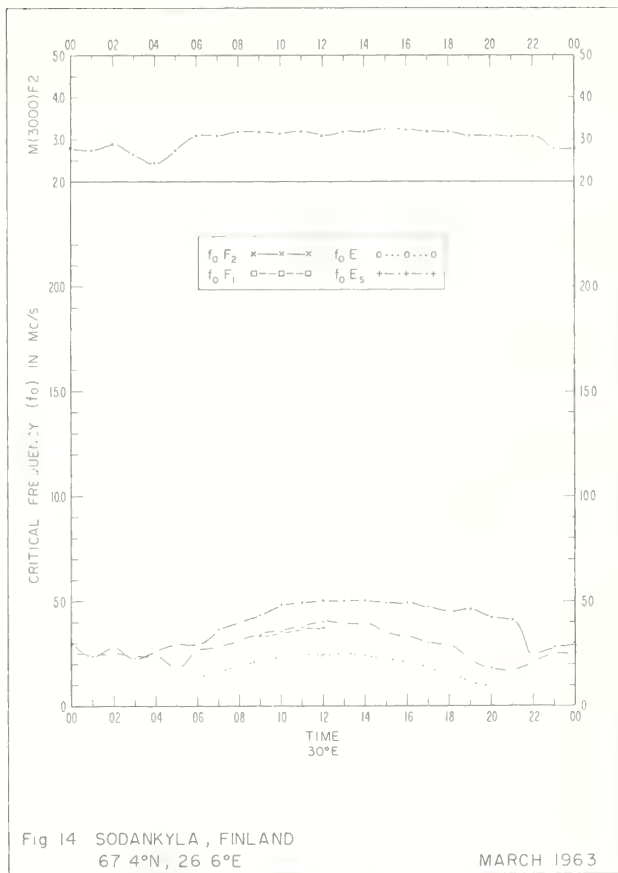
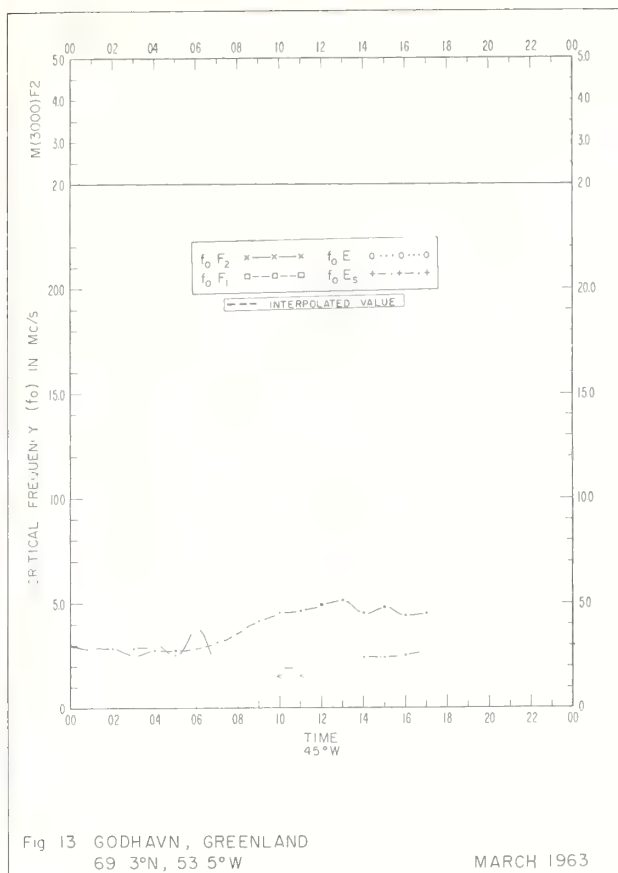
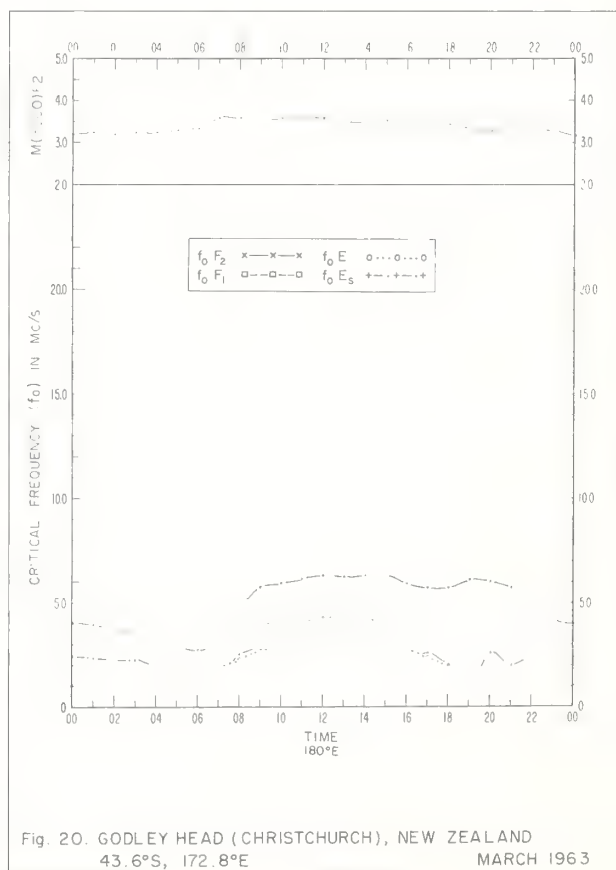
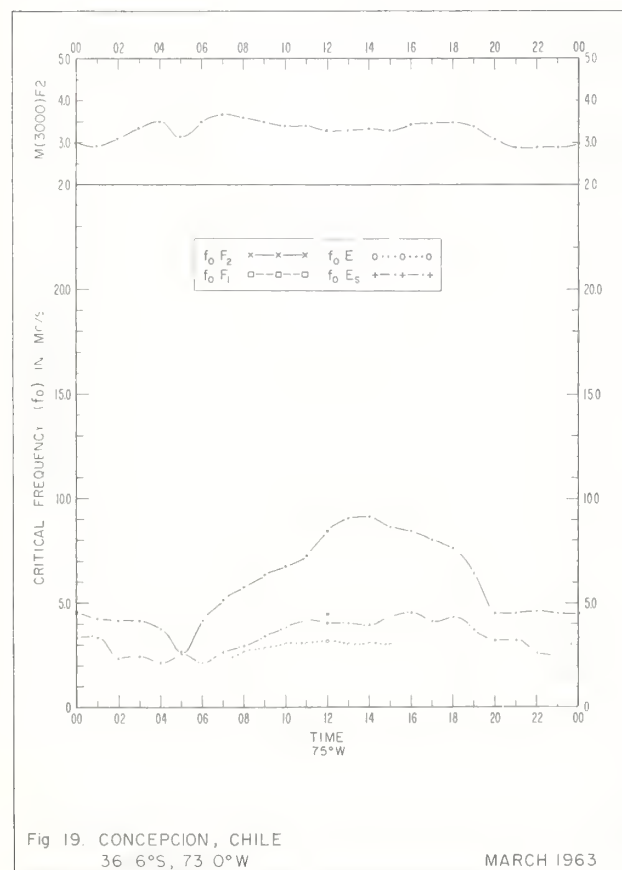
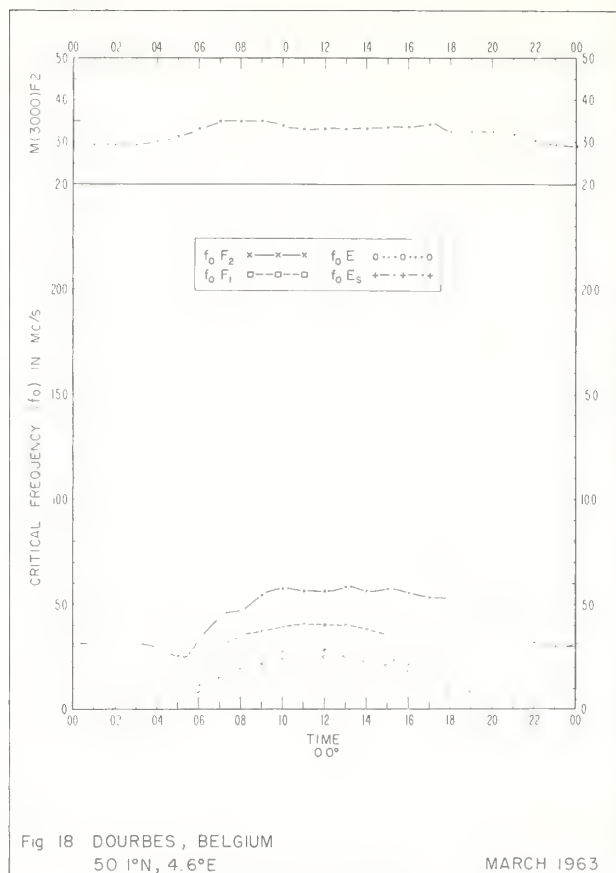
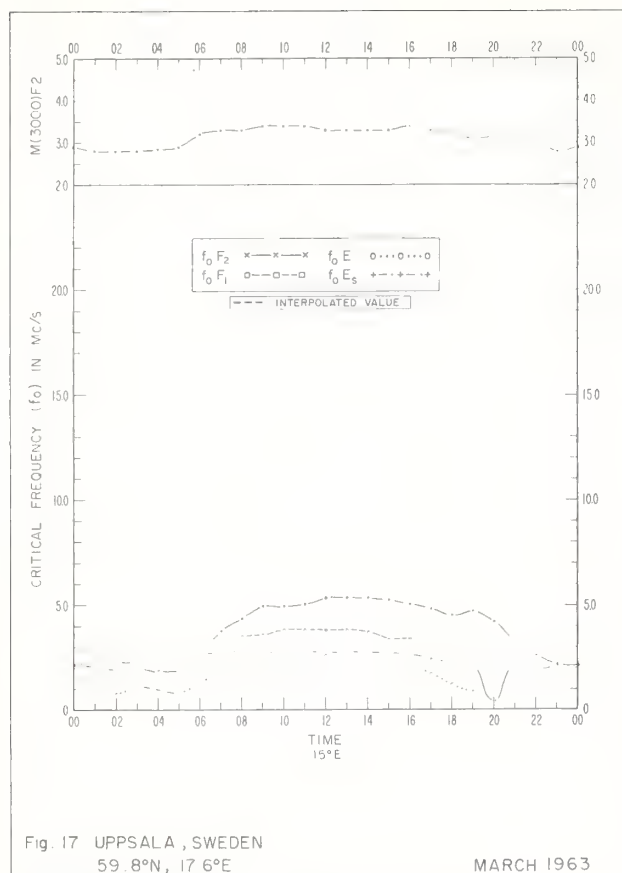


Fig. 8. KIRUNA, SWEDEN
67 8°N, 20.4°E

APRIL 1963







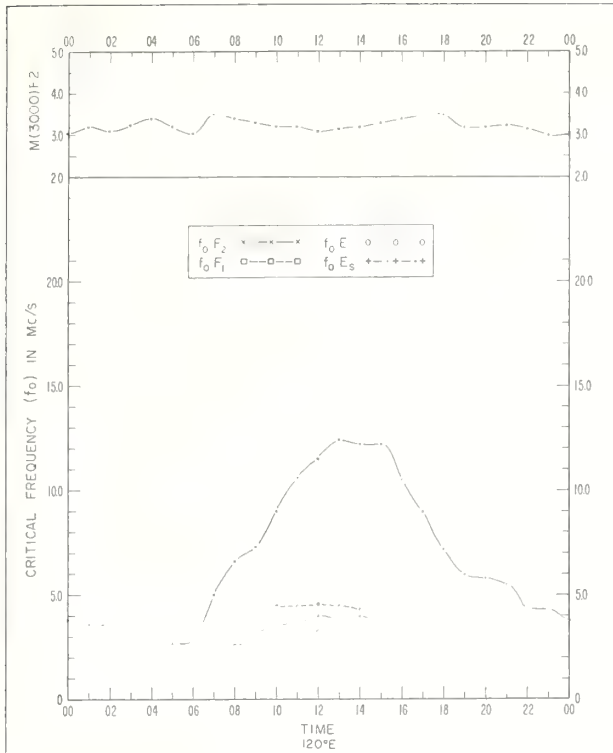


Fig 21 TAIPEI (TAIWAN), CHINA
25°N, 121°5'E

FEBRUARY 1963

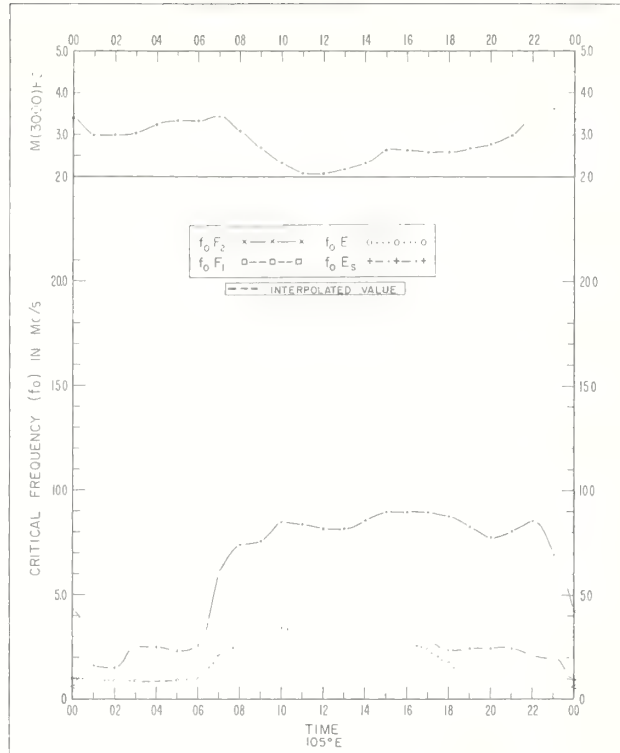


Fig. 22 SINGAPORE, BRITISH MALAYA
1°3'N, 103°8'E

FEBRUARY 1963

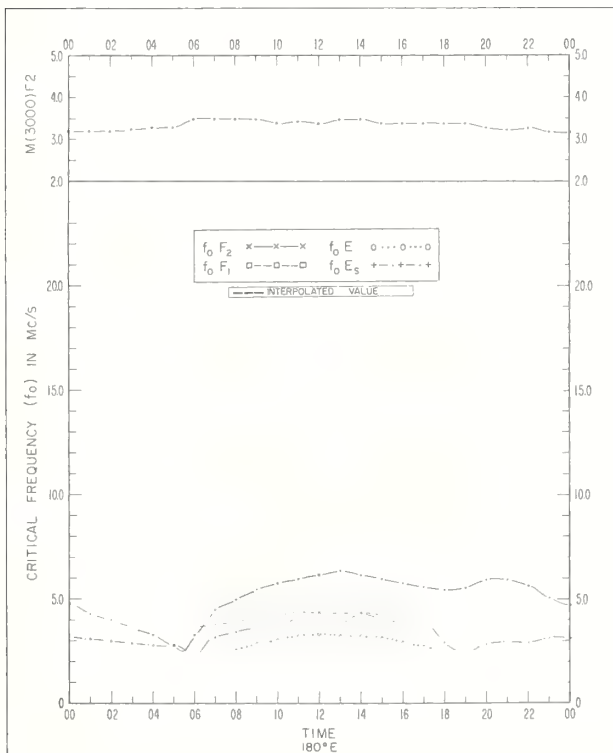


Fig. 23. GODLEY HEAD (CHRISTCHURCH), NEW ZEALAND
43.6°S, 172°8'E

FEBRUARY 1963

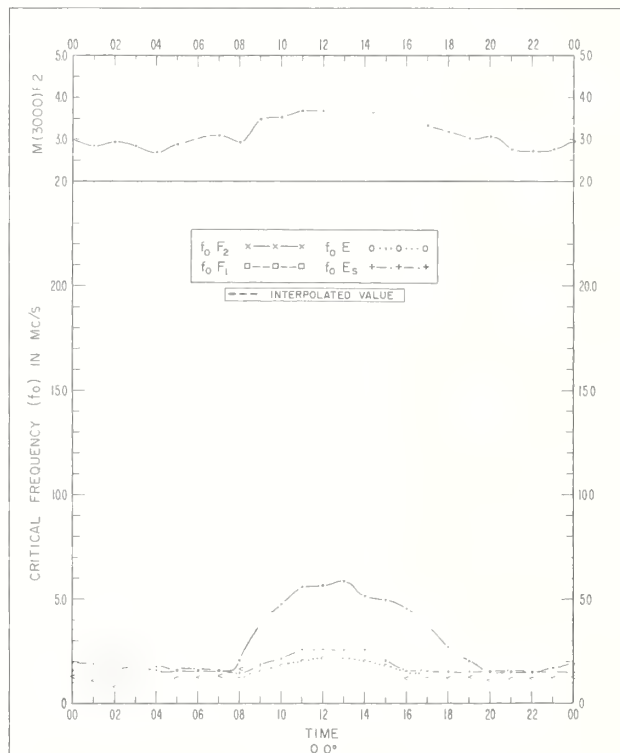
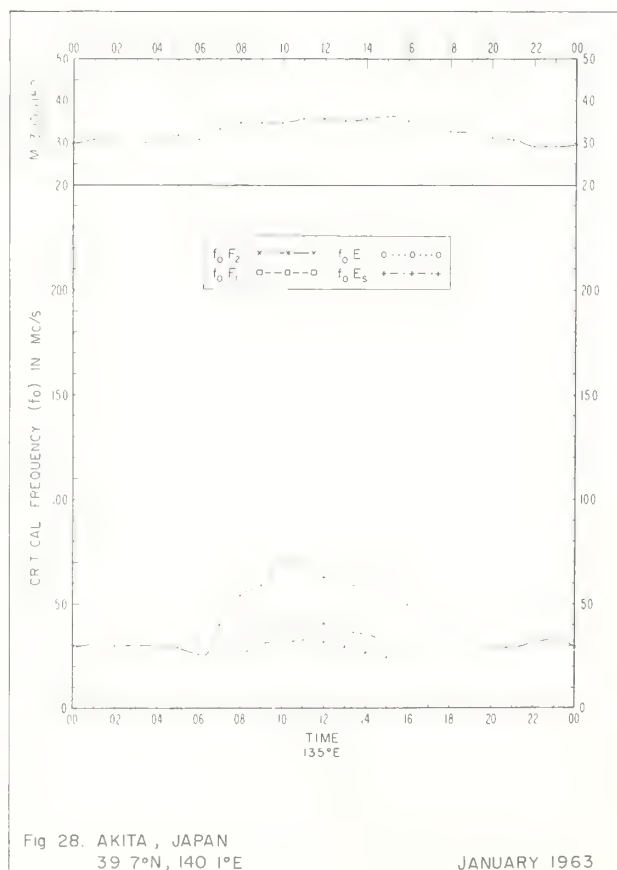
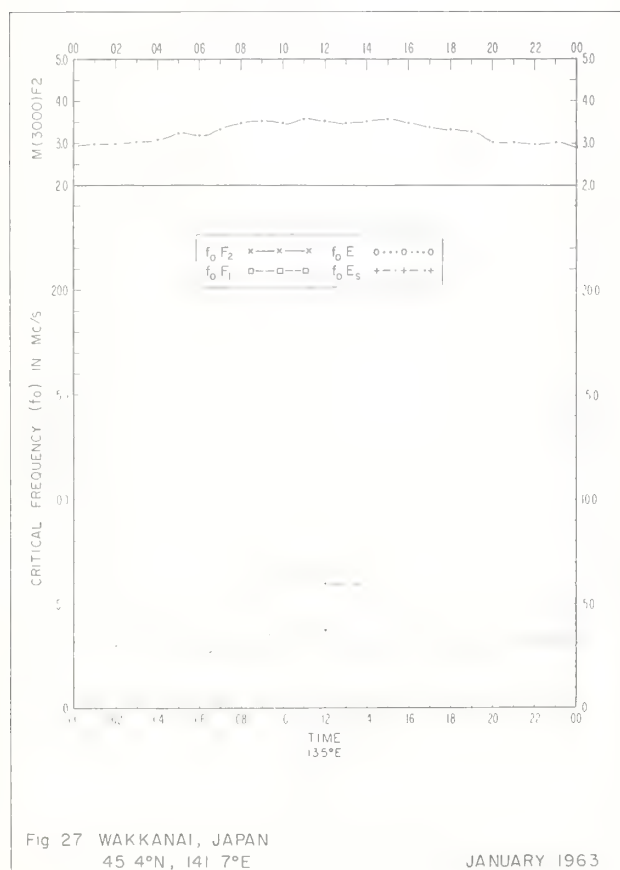
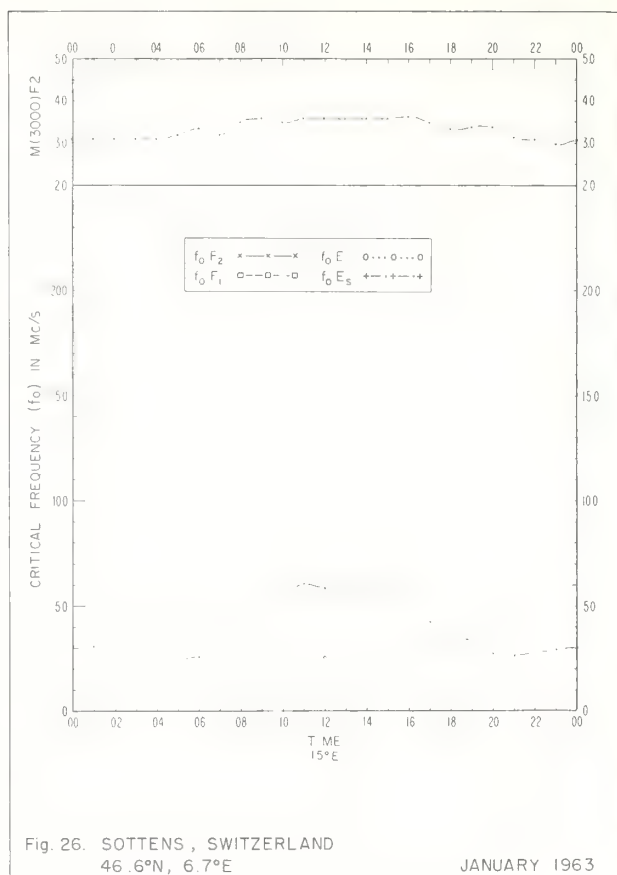
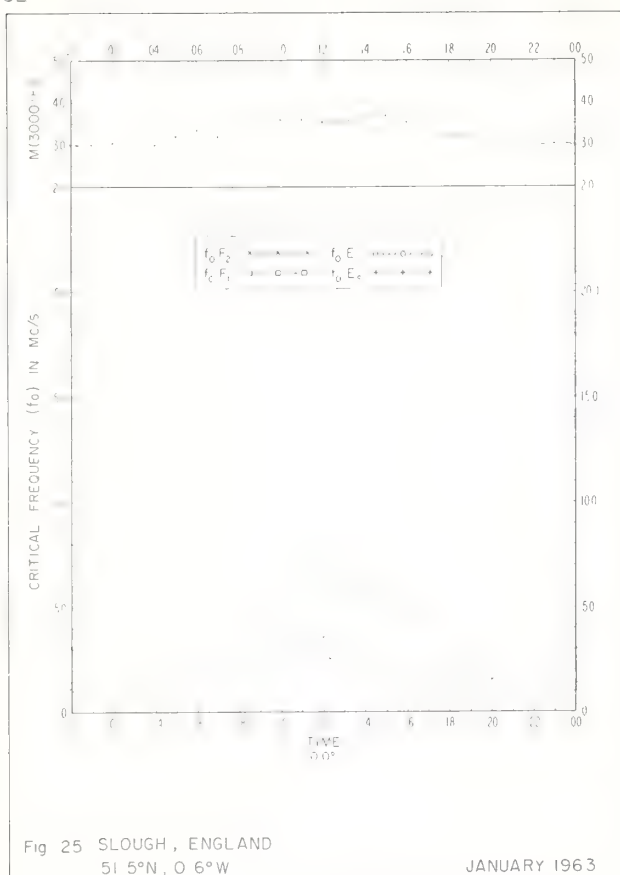
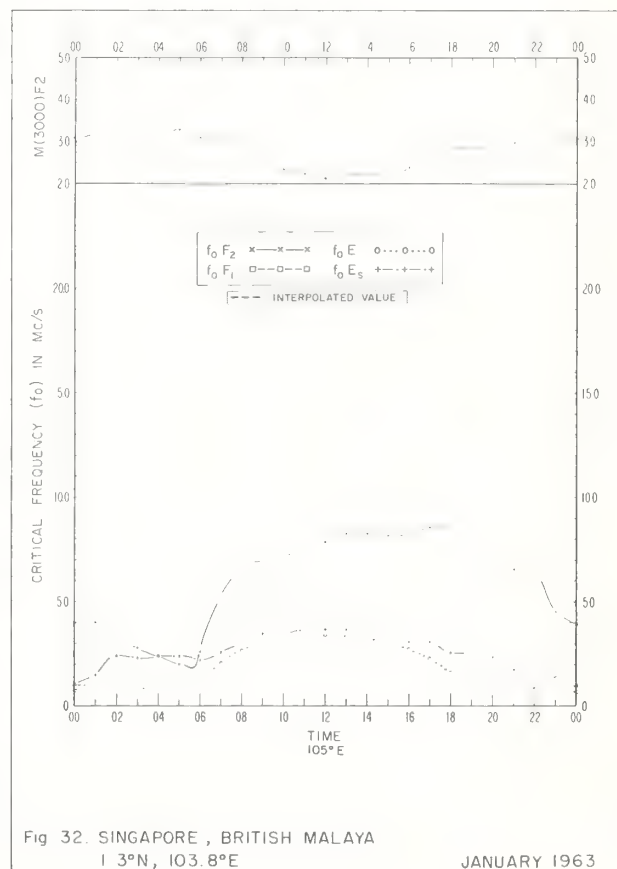
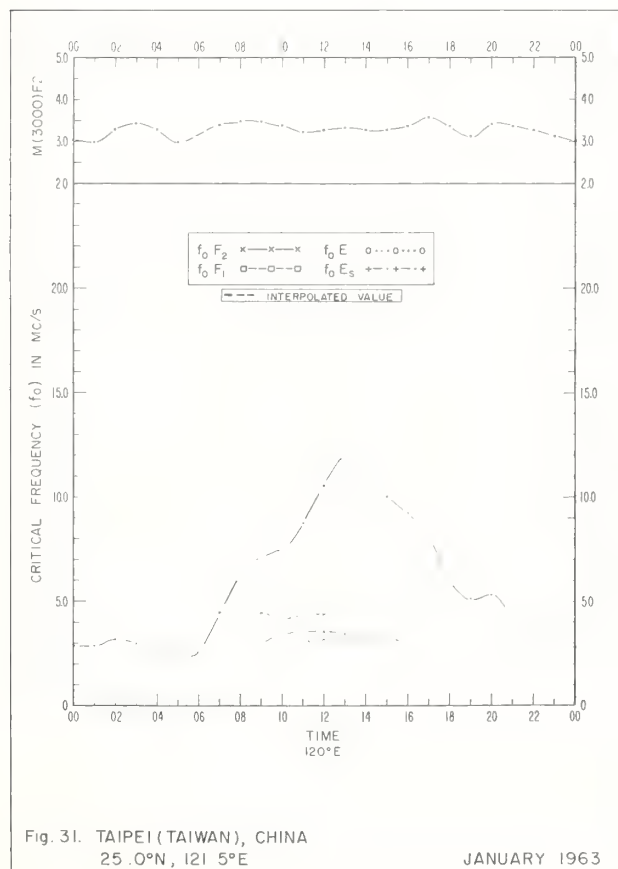
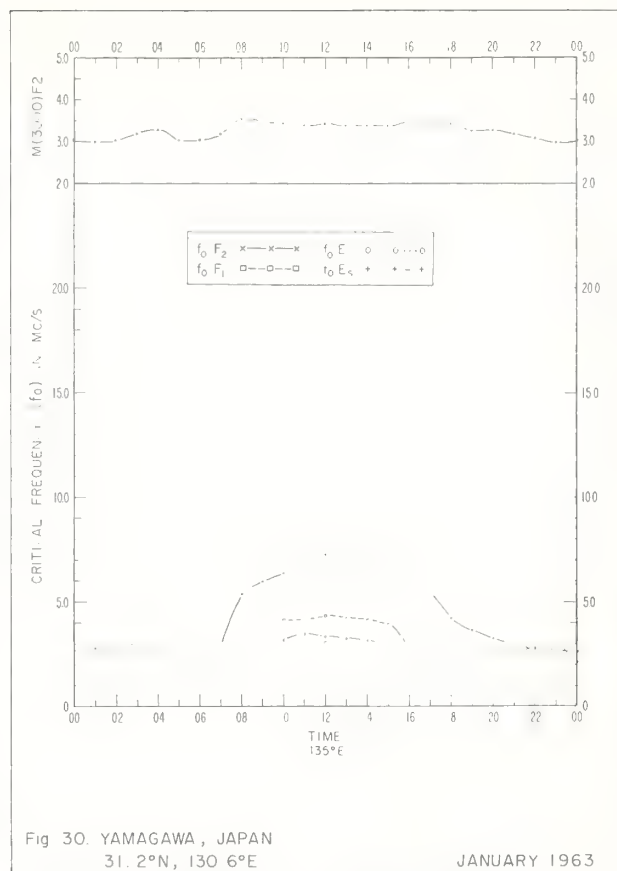
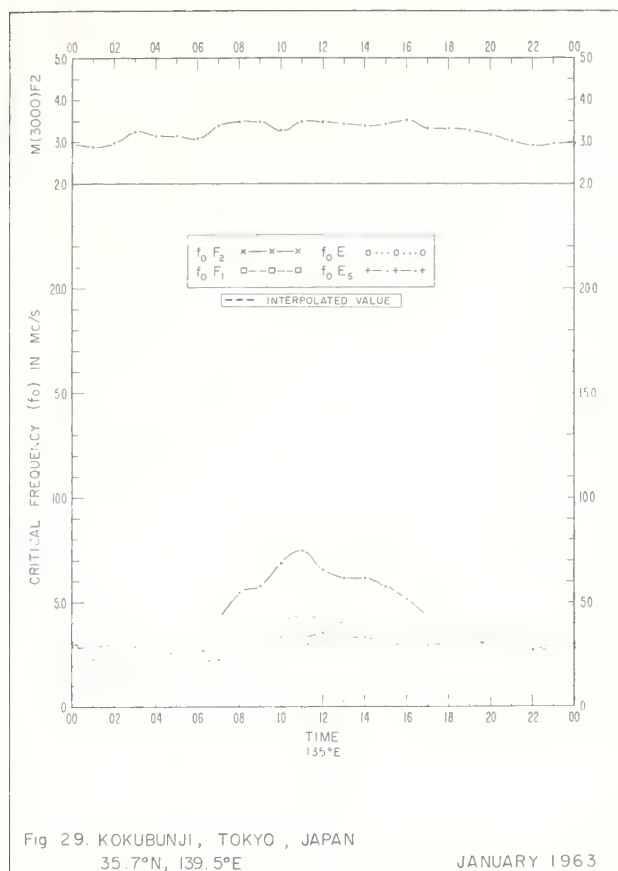
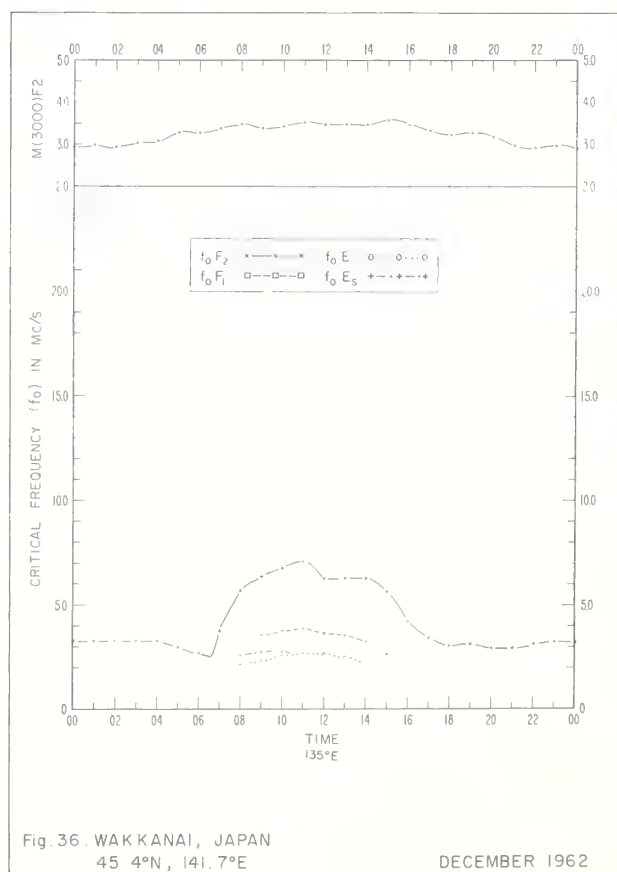
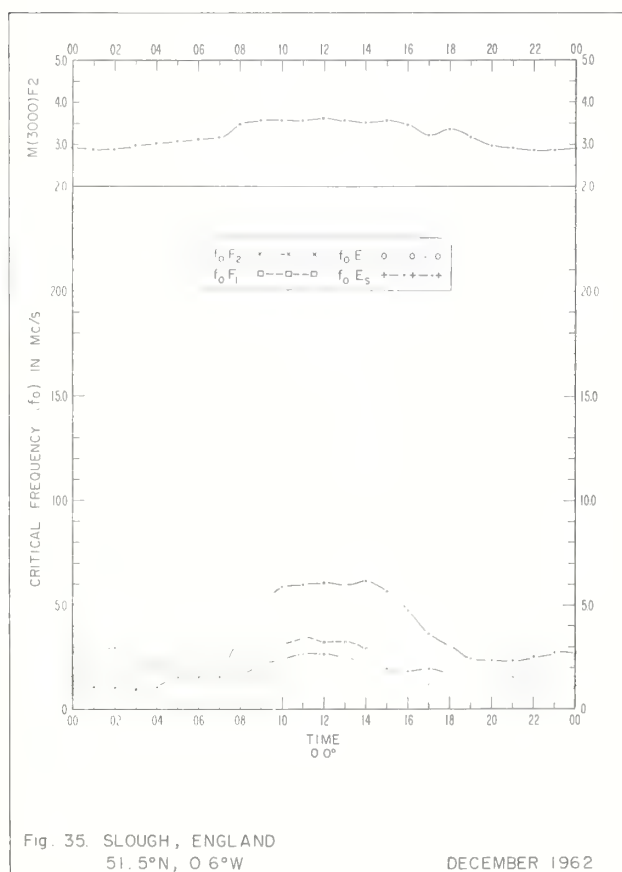
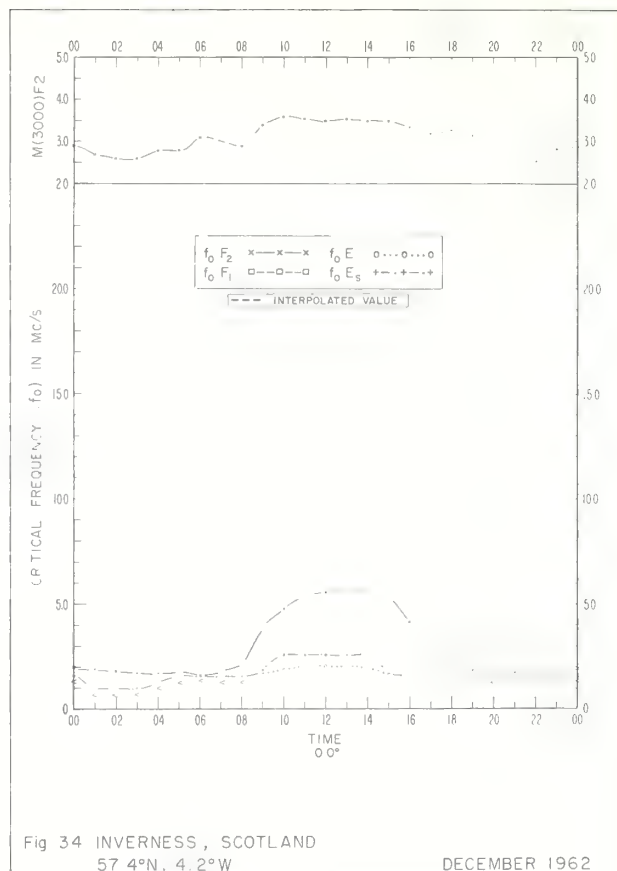
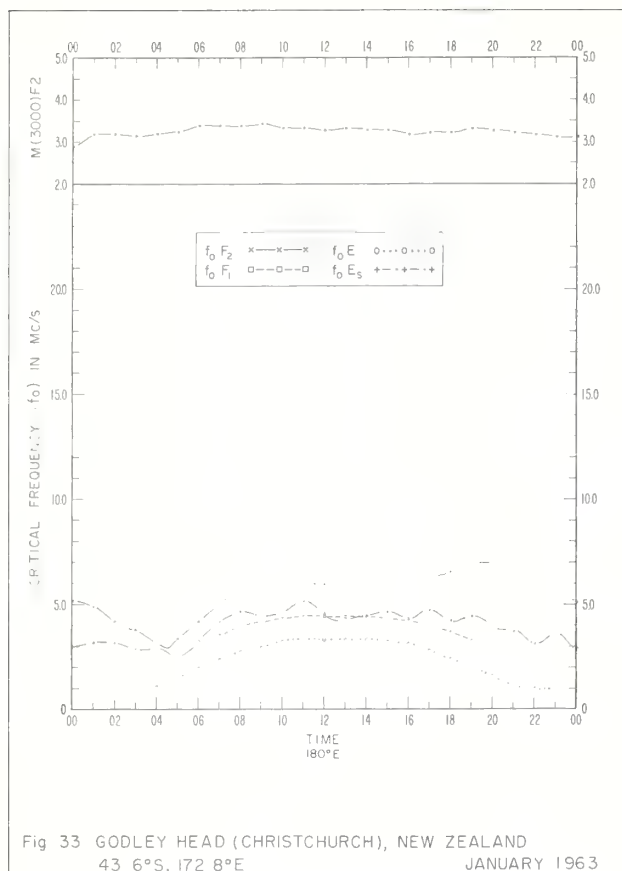


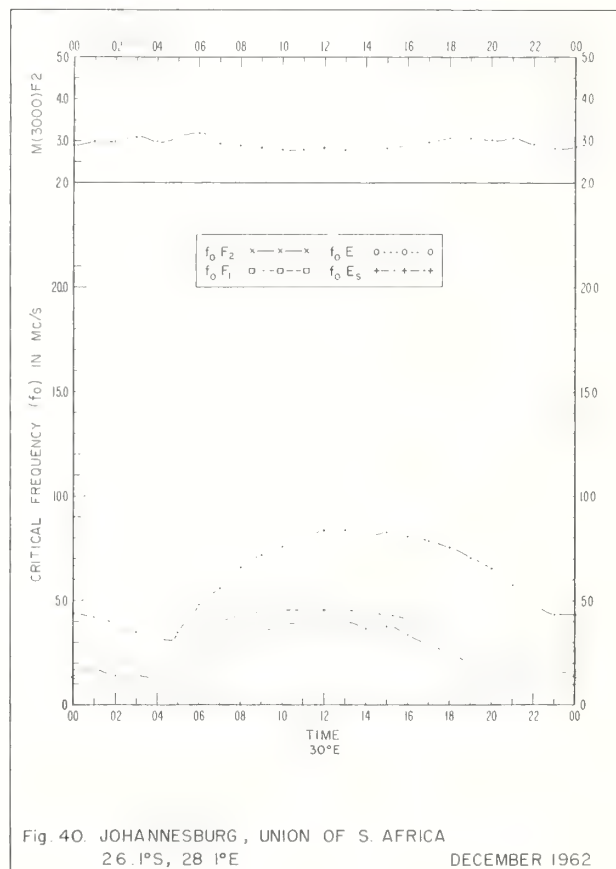
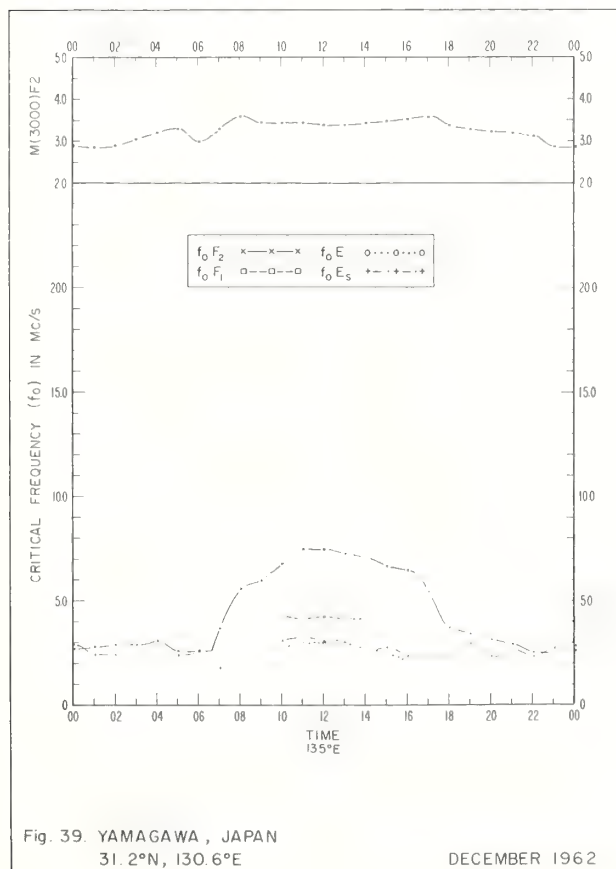
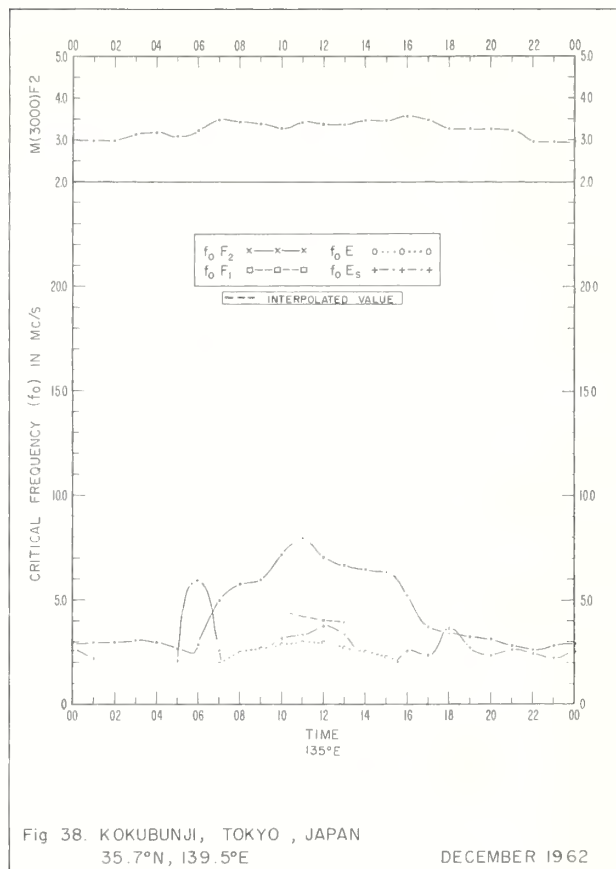
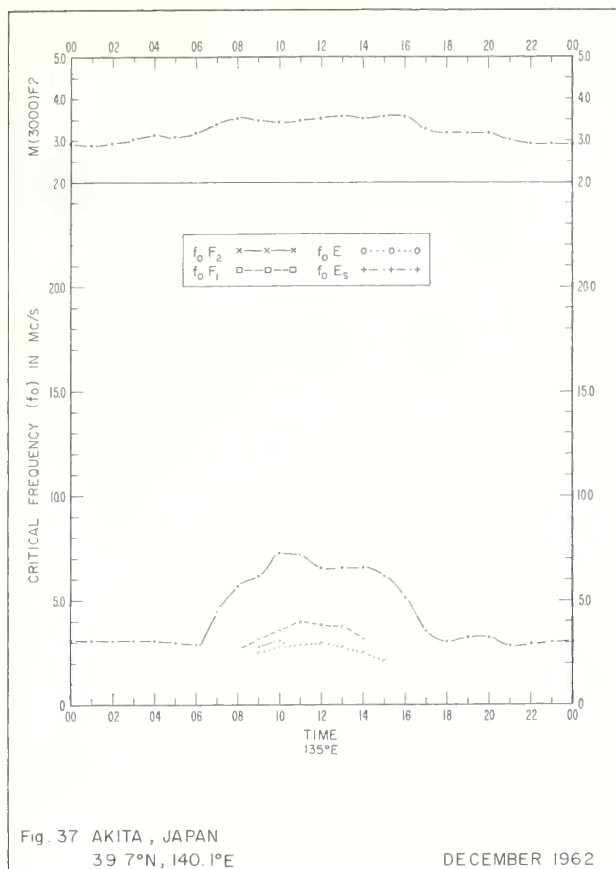
Fig. 24. INVERNESS, SCOTLAND
57.4°N, 4.2°W

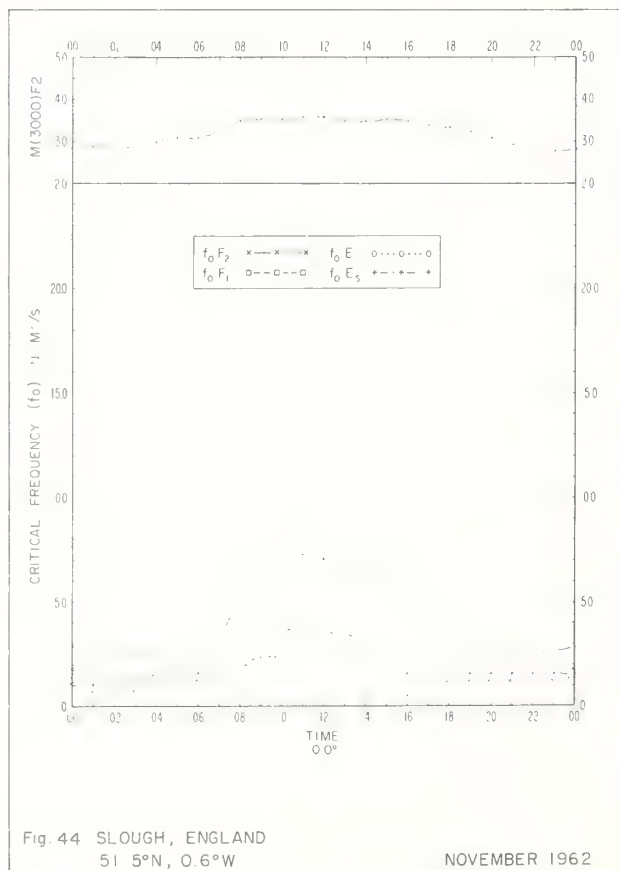
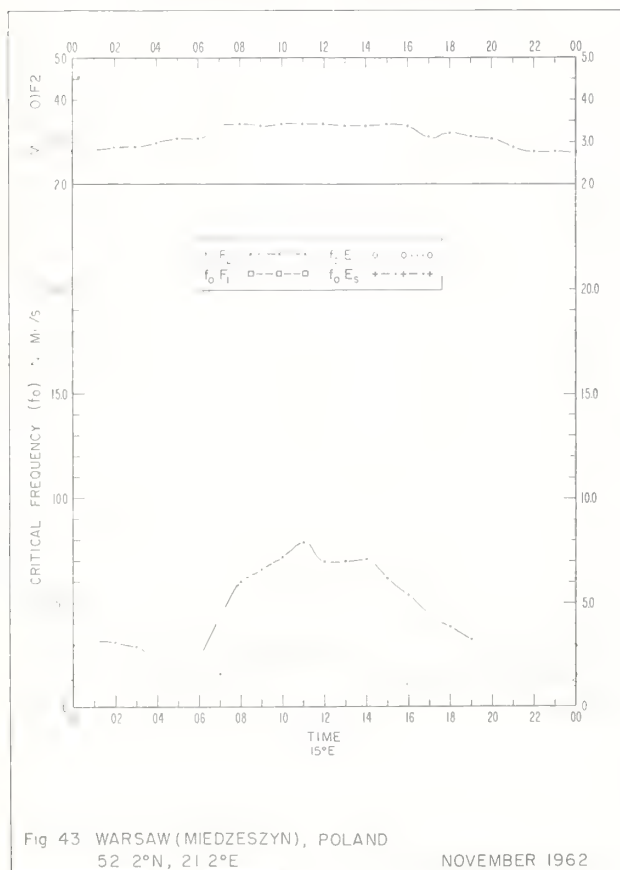
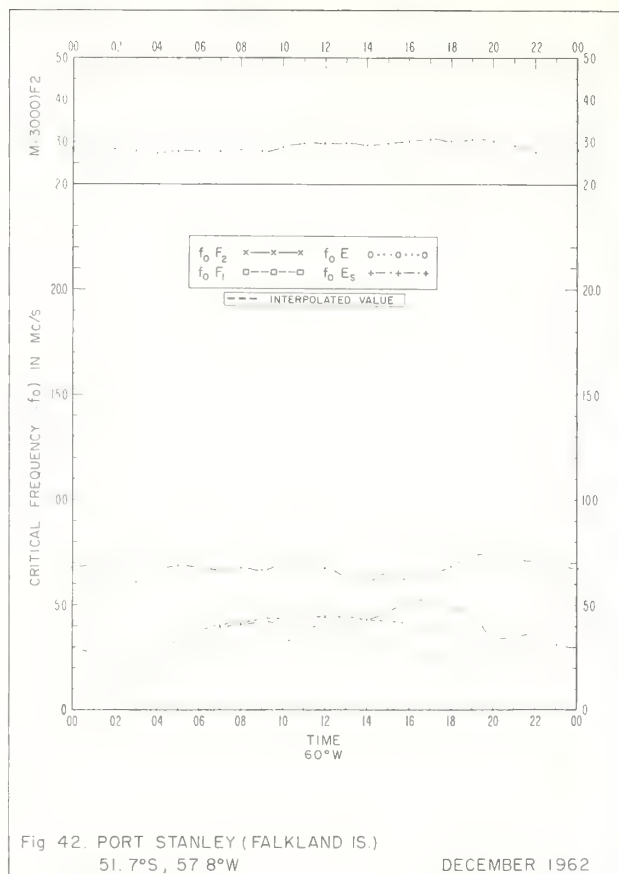
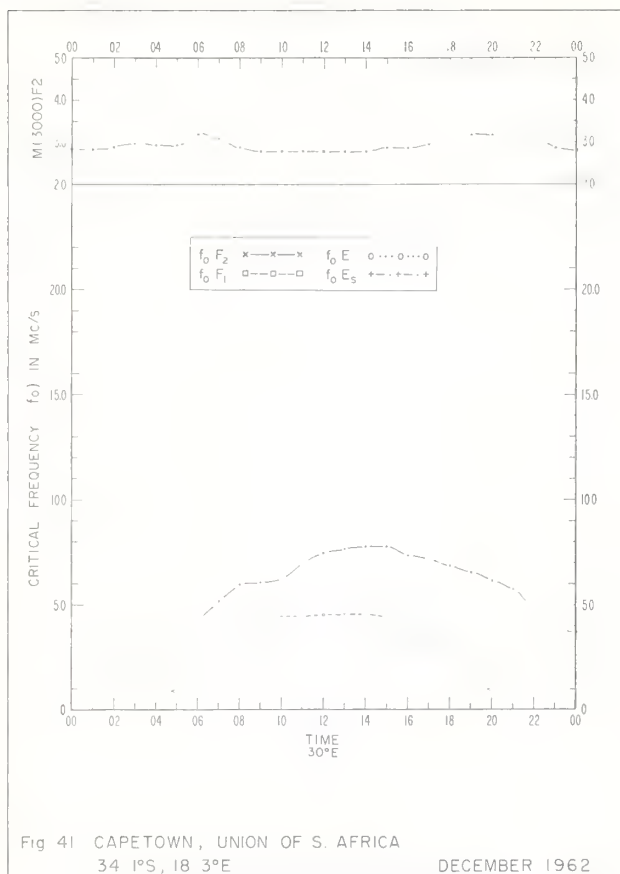
JANUARY 1963











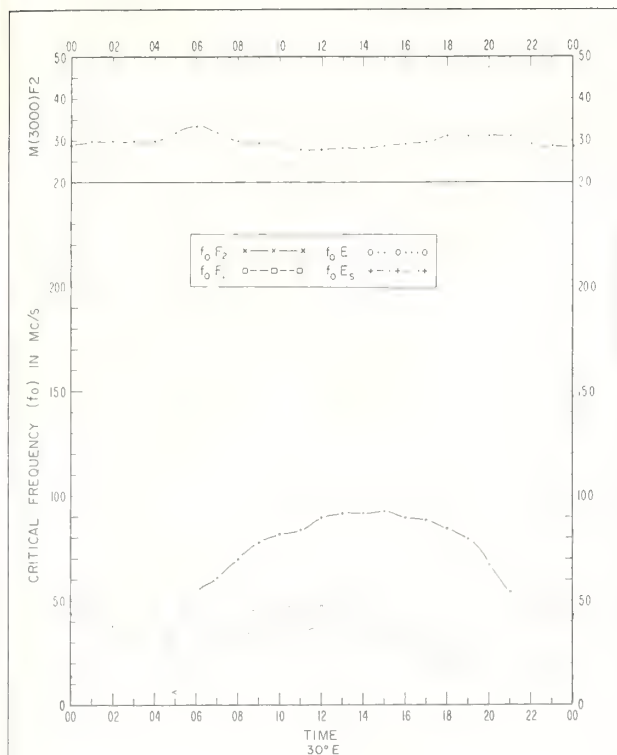


Fig 45. JOHANNESBURG, UNION OF S. AFRICA
26.1°S, 28.1°E
NOVEMBER 1962

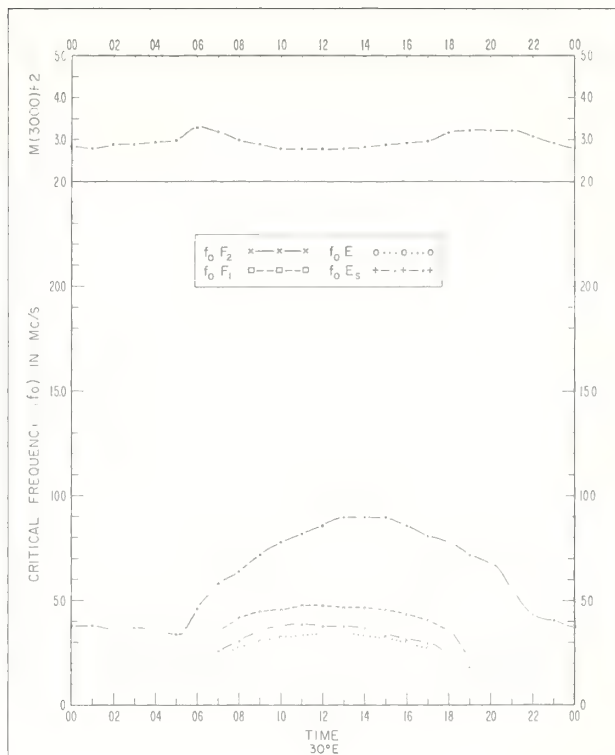


Fig 46. CAPETOWN, UNION OF S. AFRICA
34.1°S, 8.3°E
NOVEMBER 1962

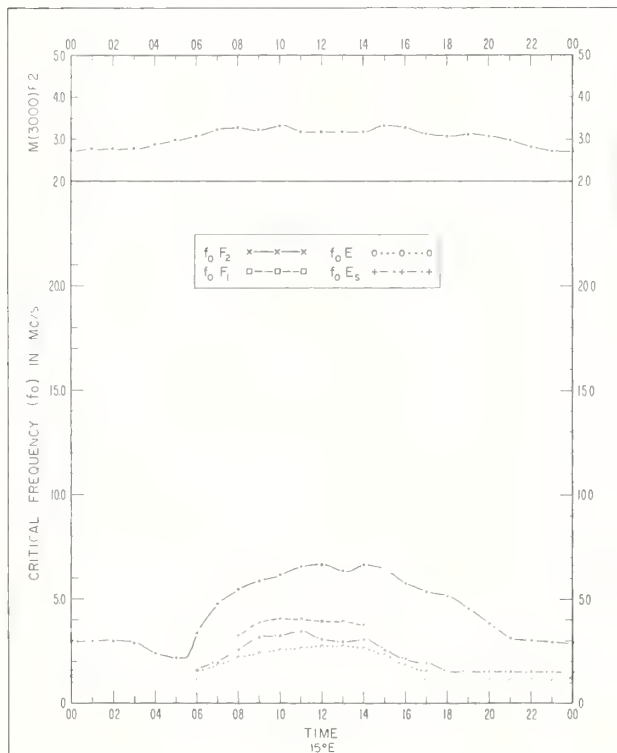


Fig. 47. WARSAW (MIEDZESZYN), POLAND
52.2°N, 21.2°E
OCTOBER 1962

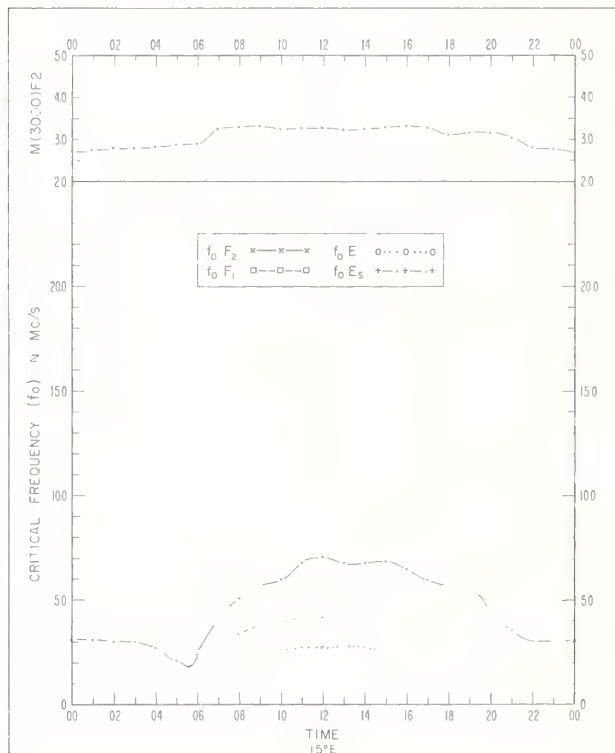
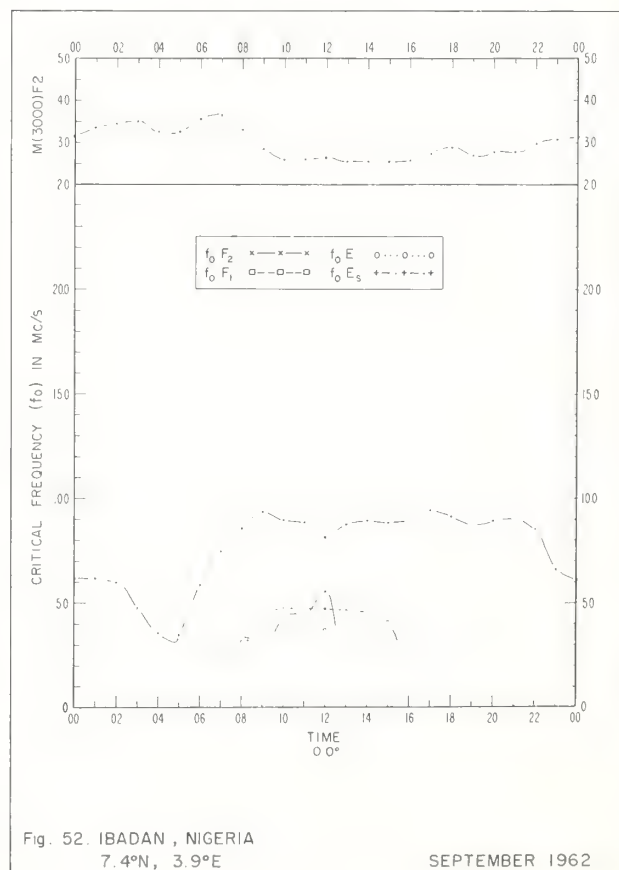
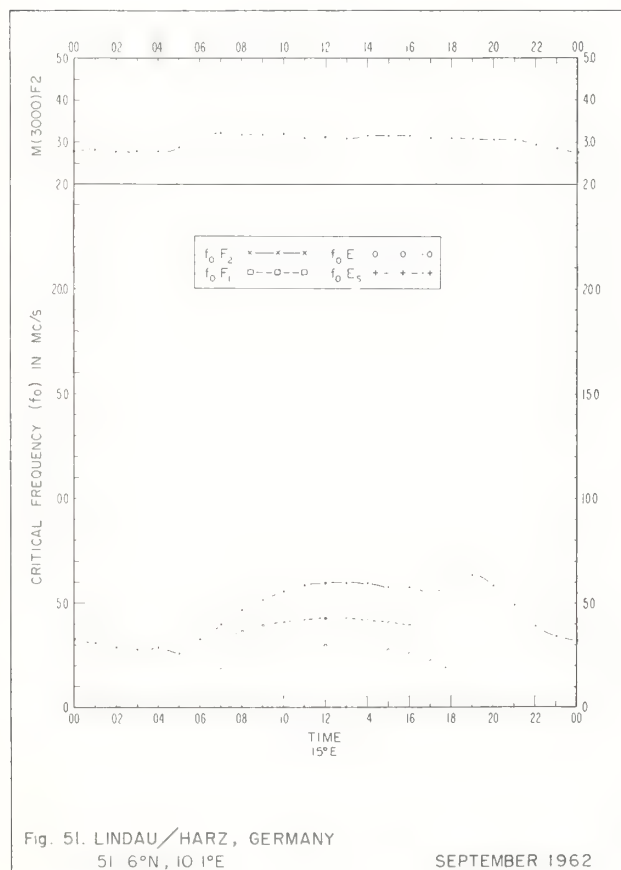
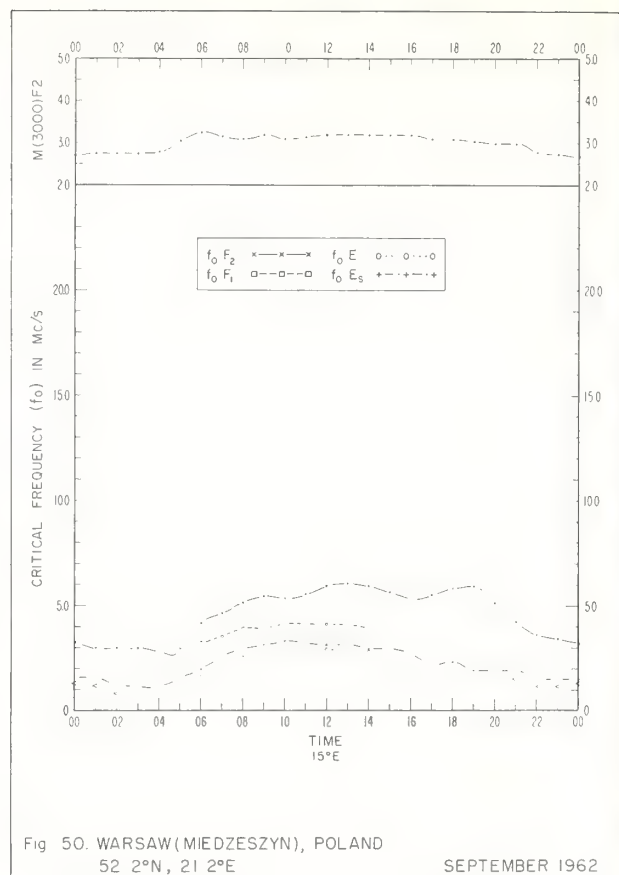
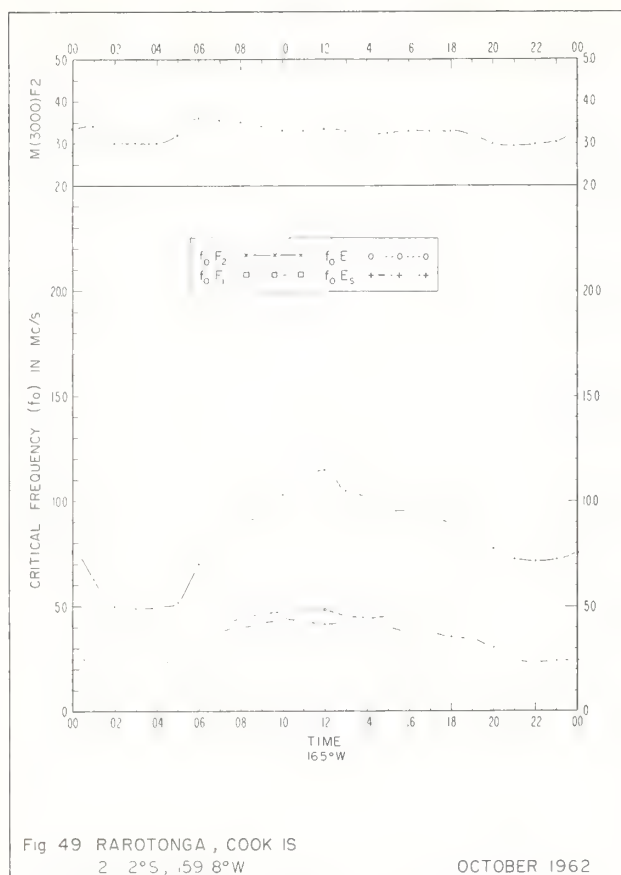
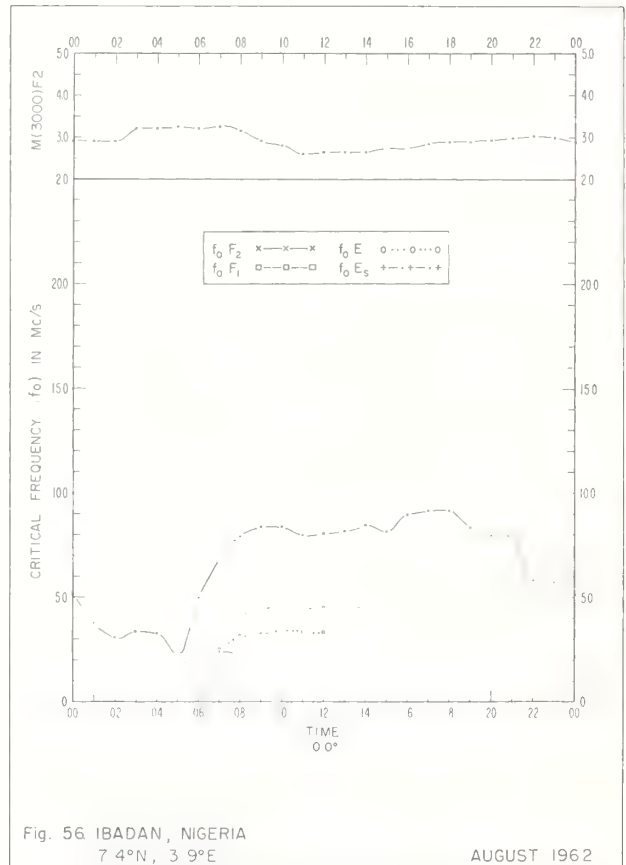
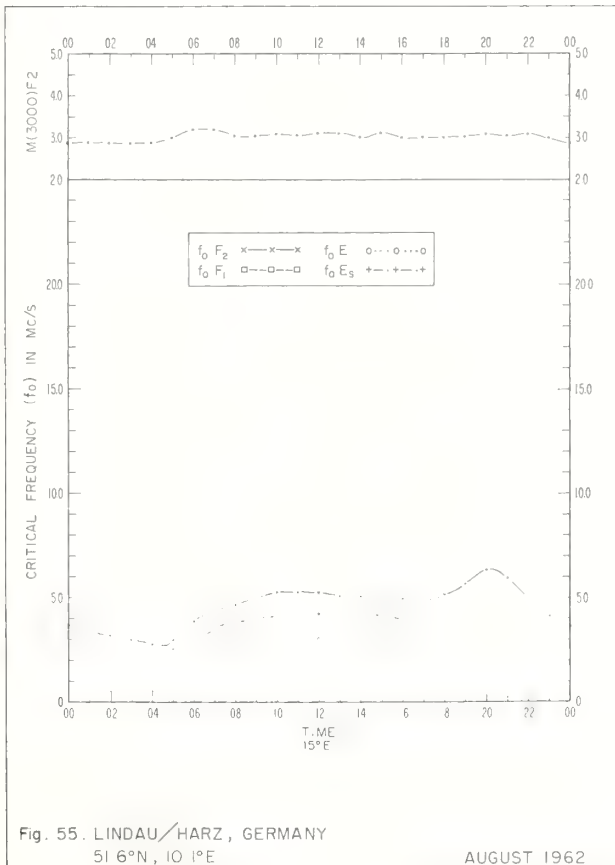
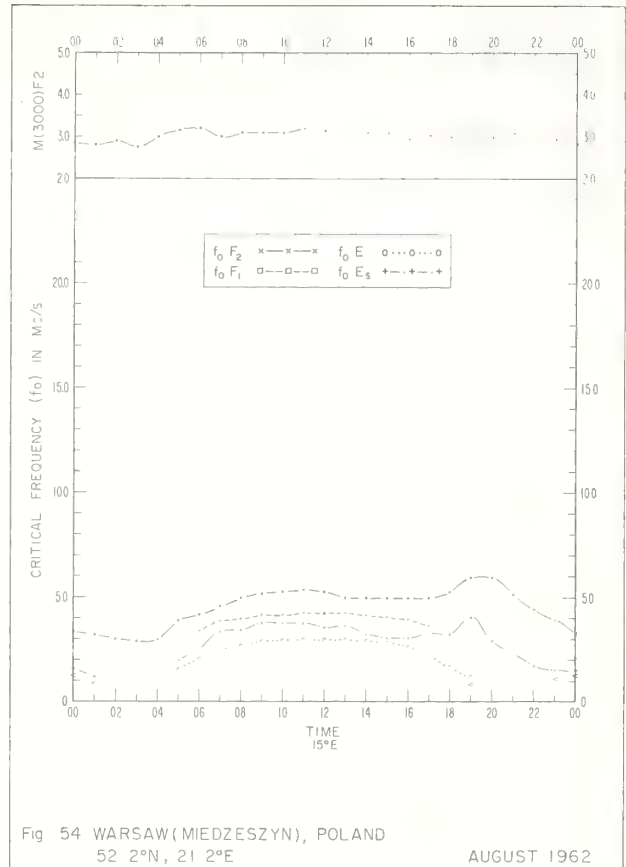
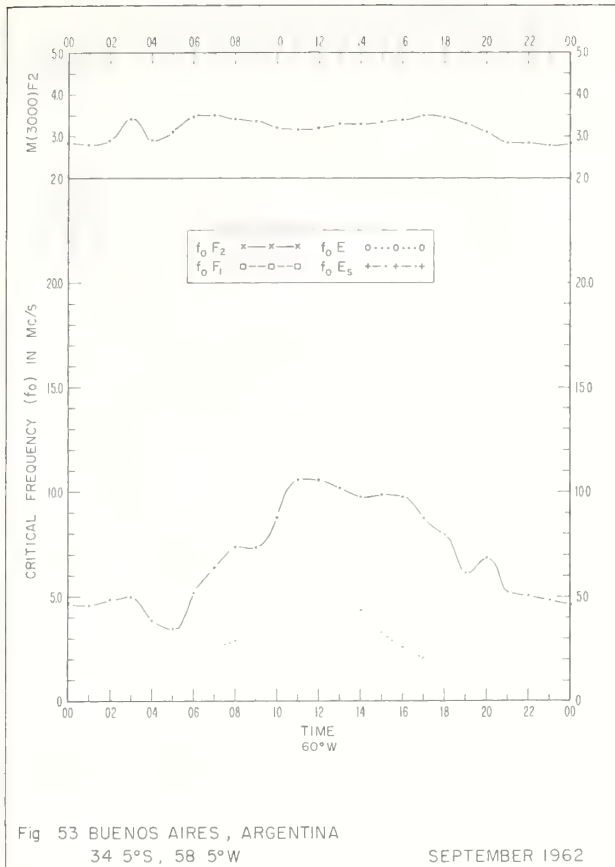
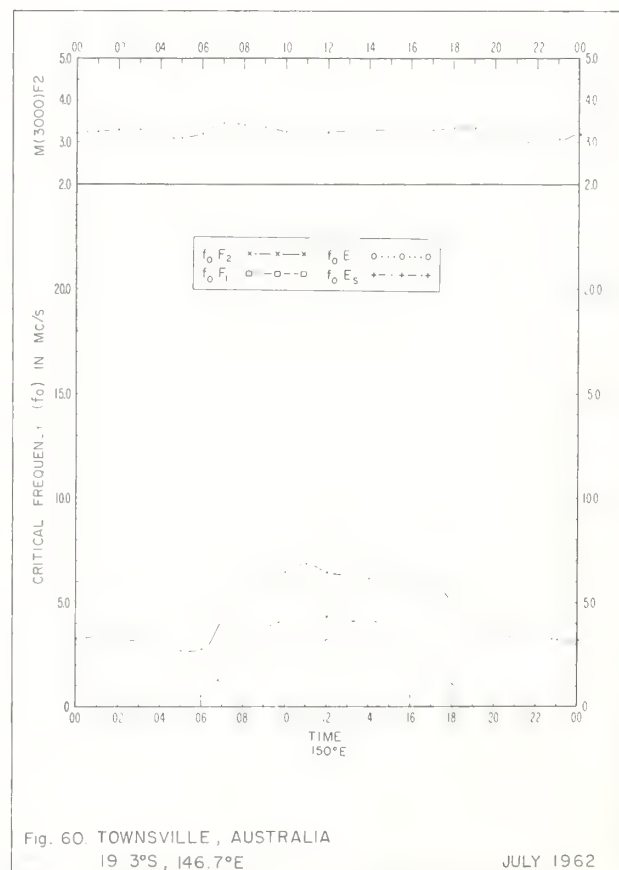
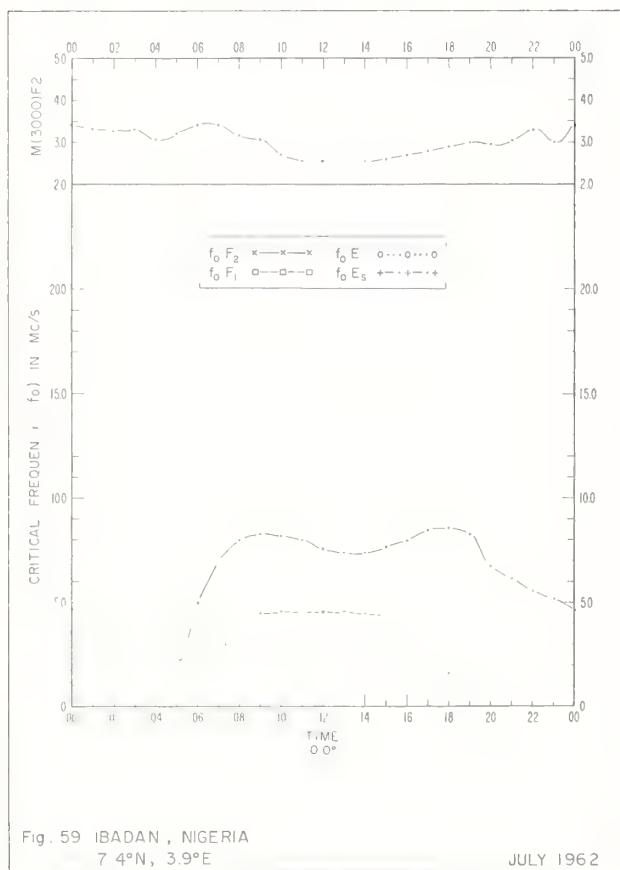
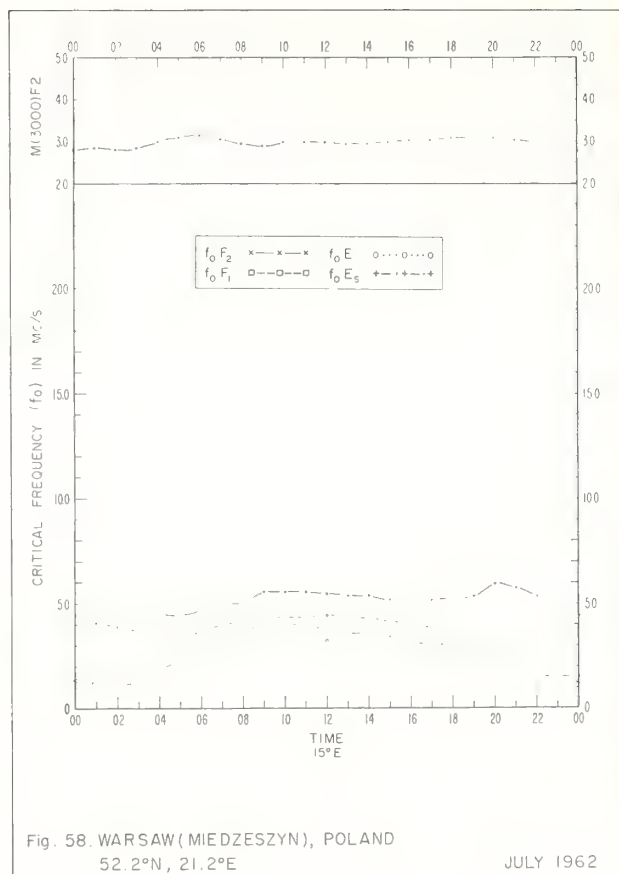
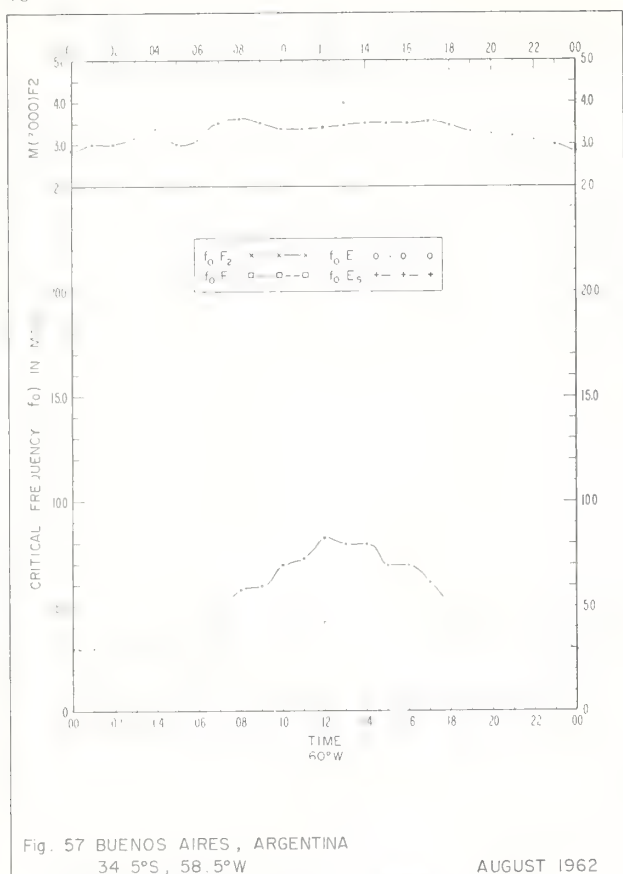
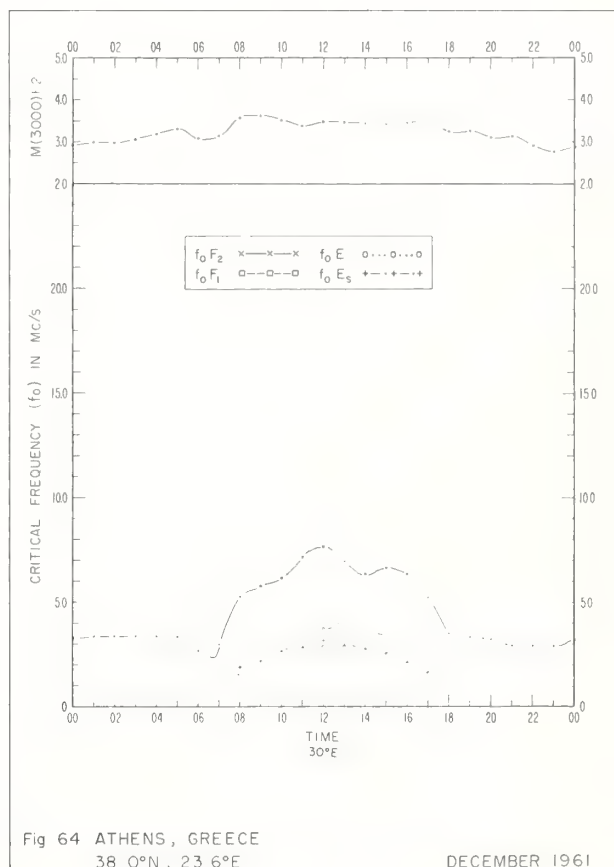
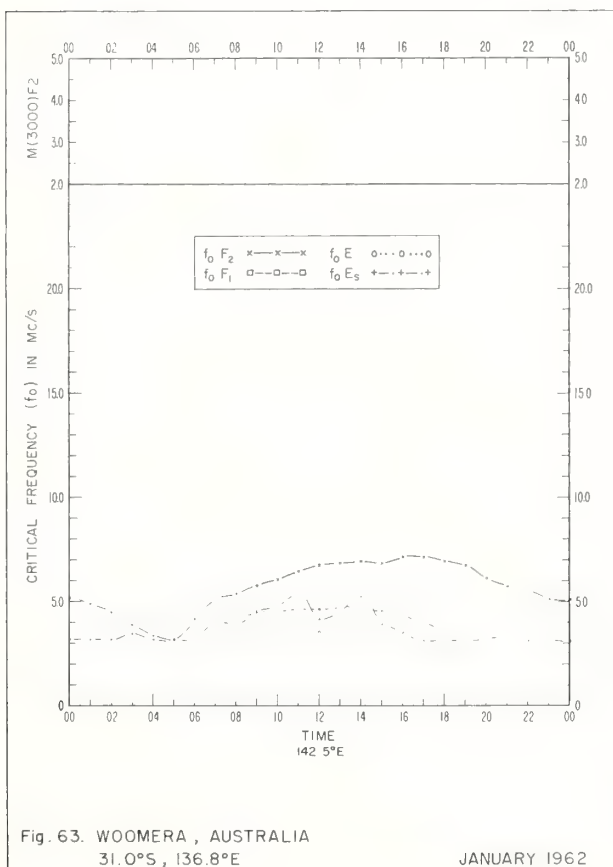
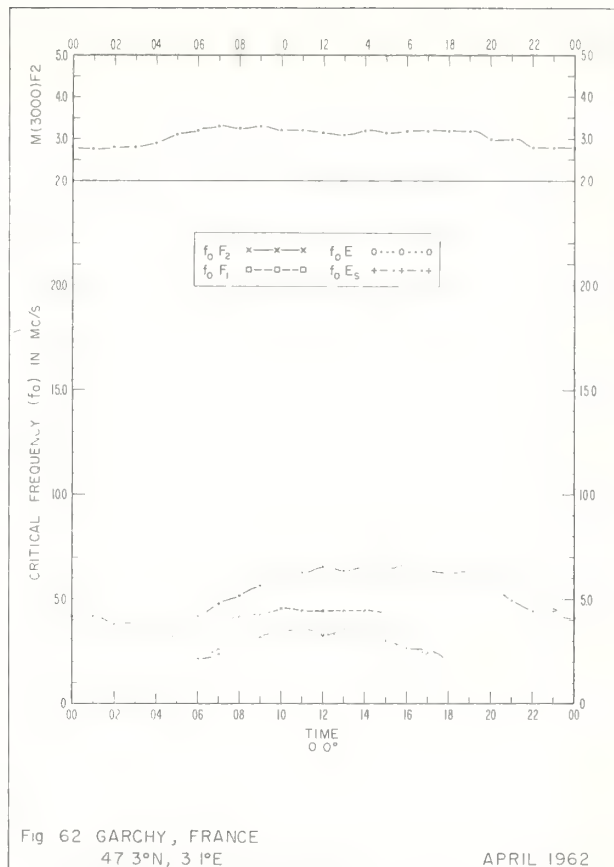
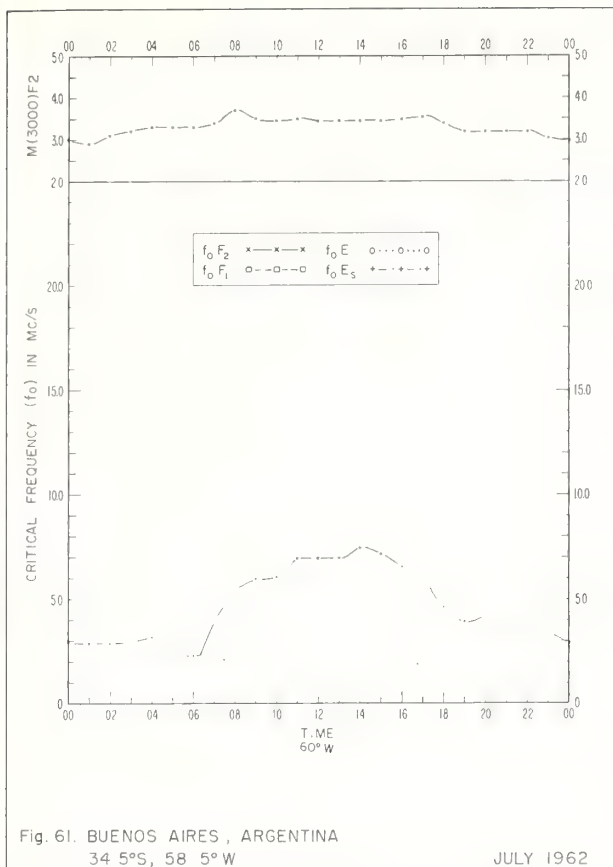


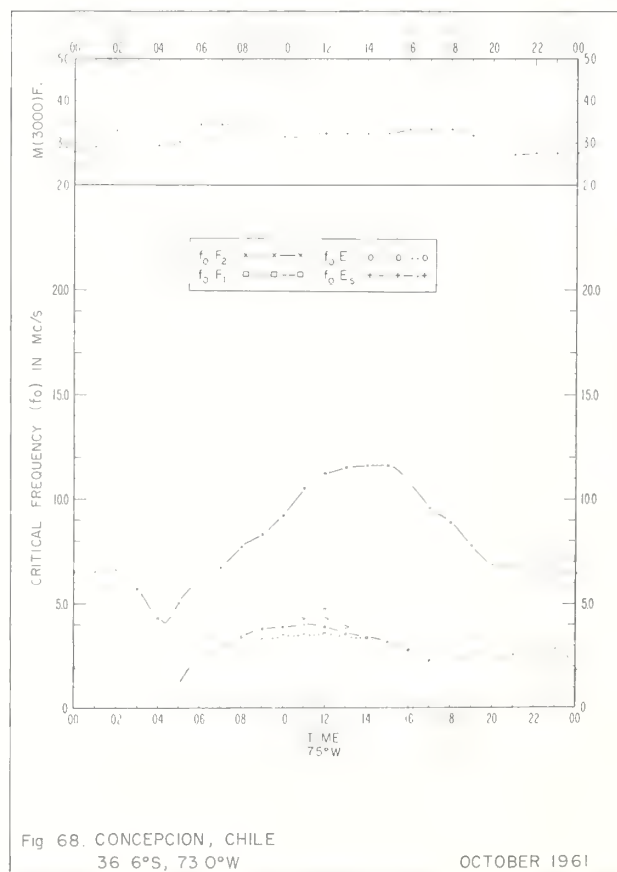
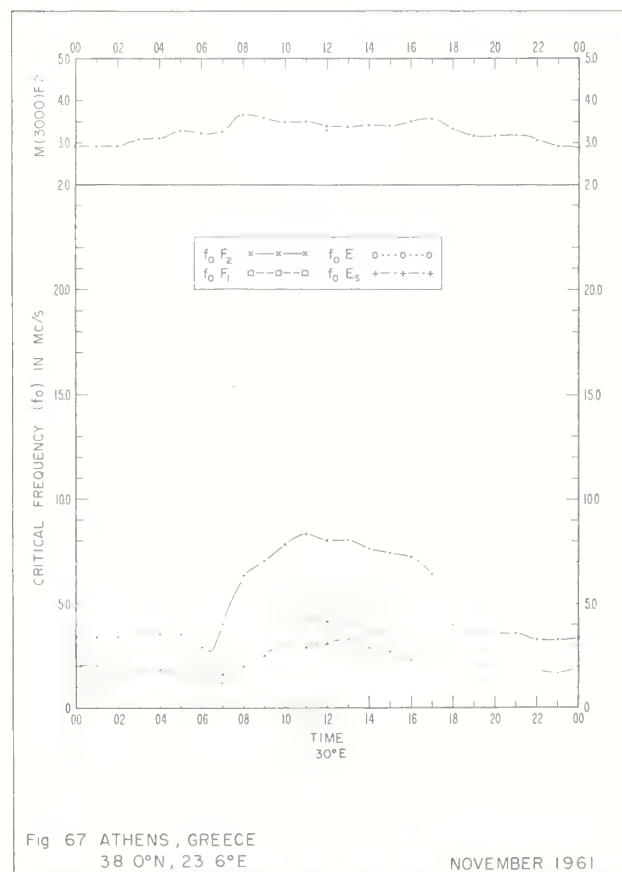
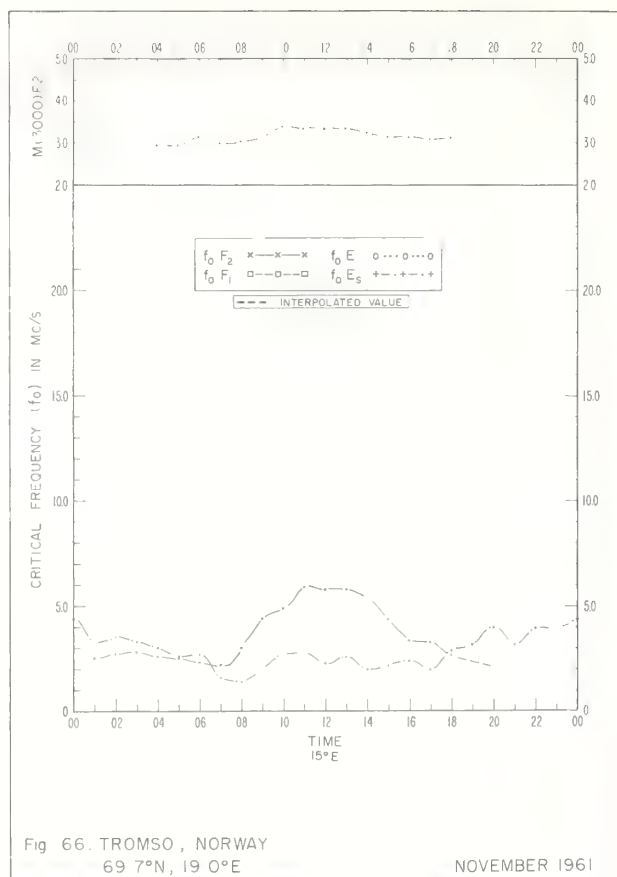
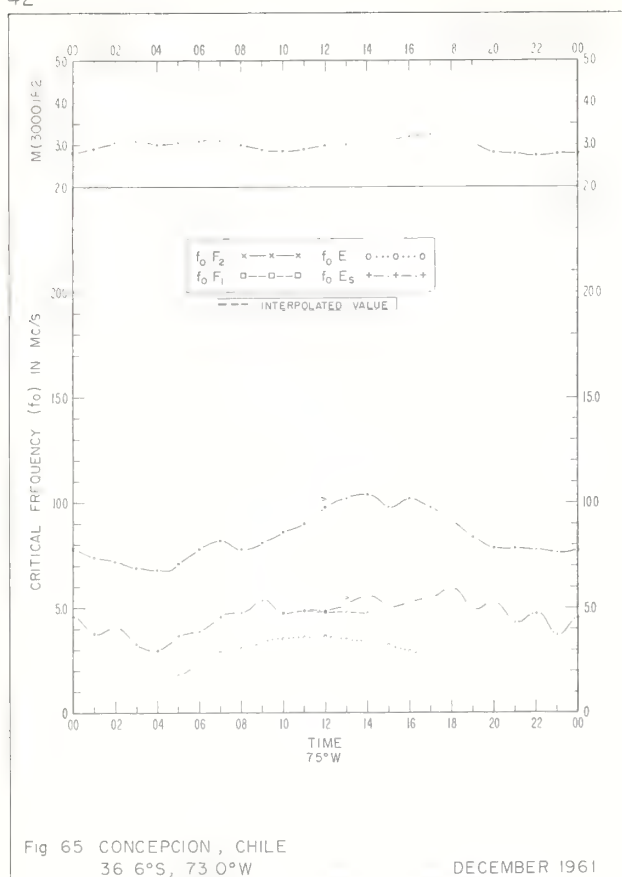
Fig. 48. LINDAU/HARZ, GERMANY
51.6°N, 10.1°E
OCTOBER 1962

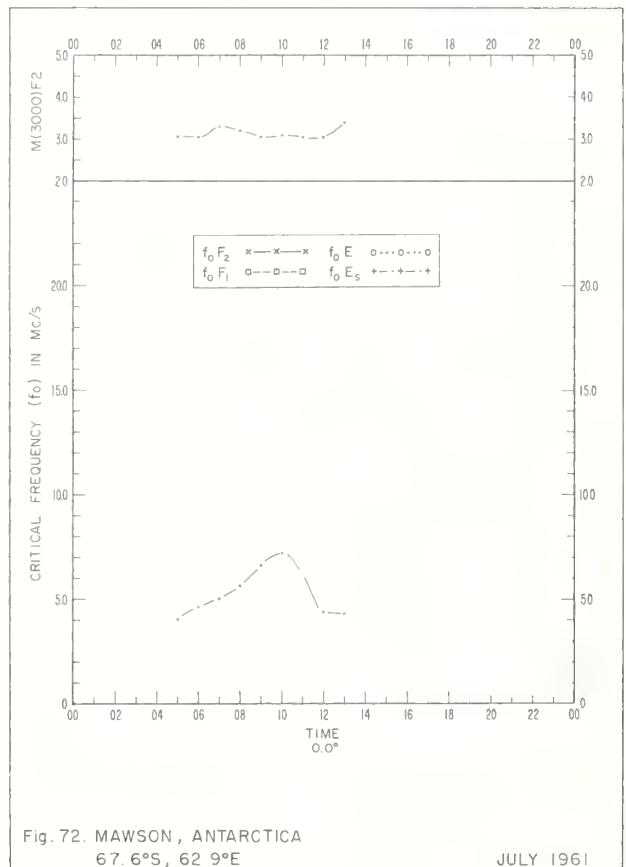
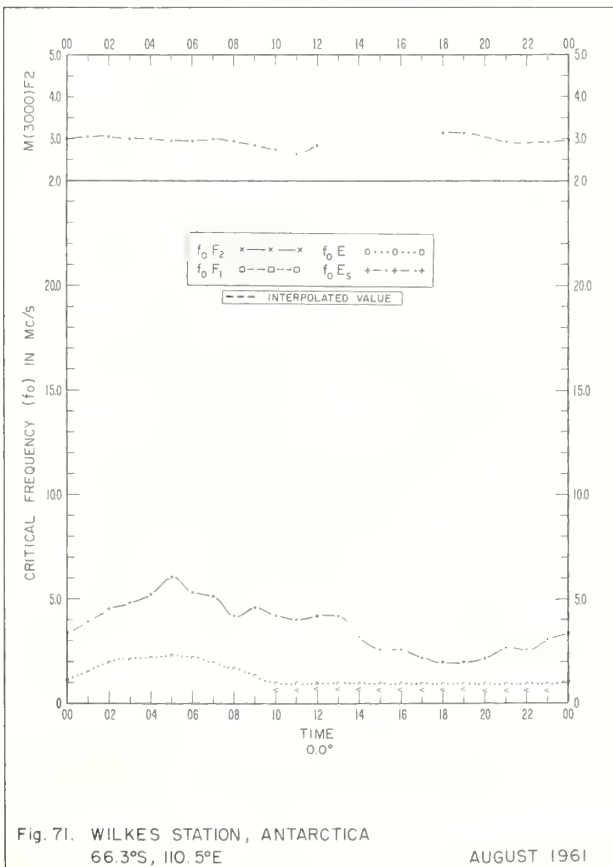
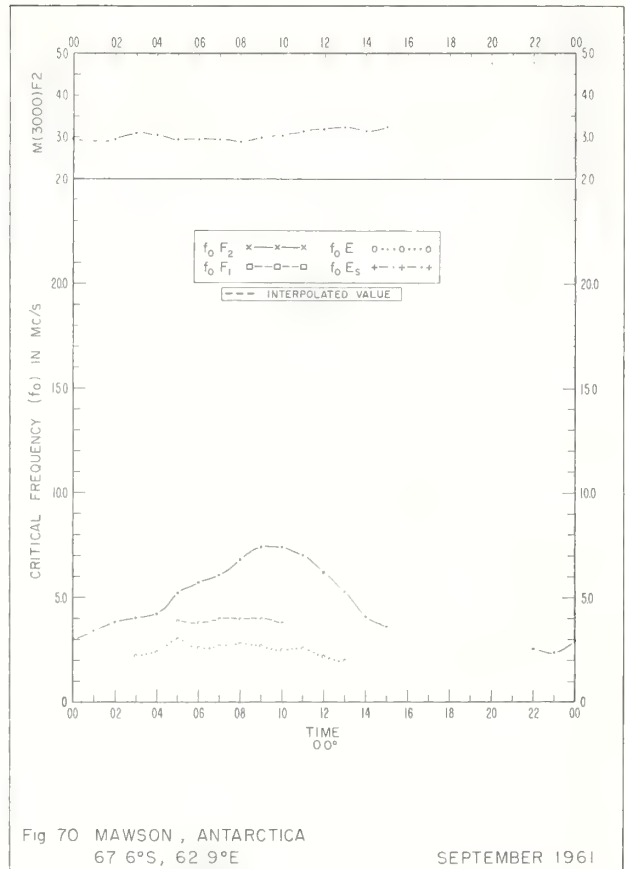
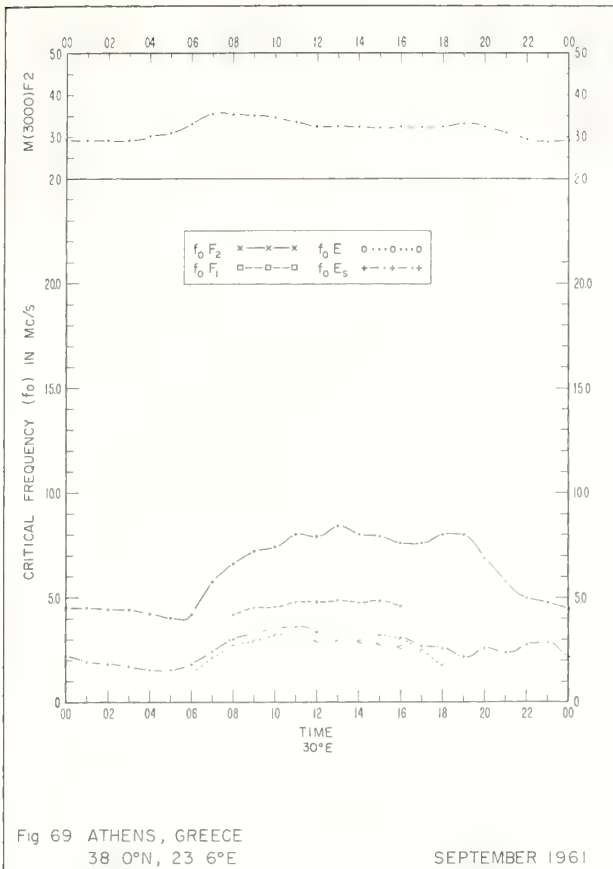


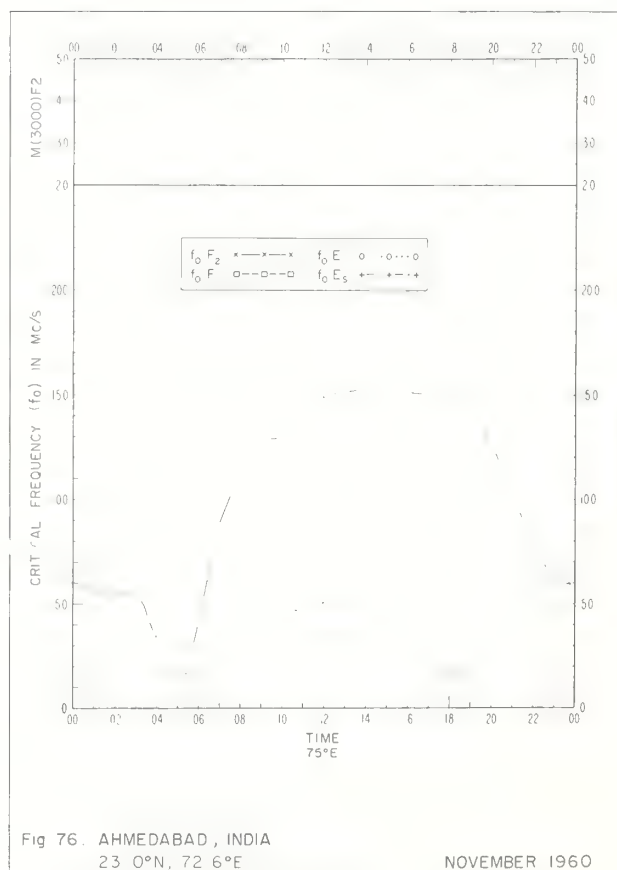
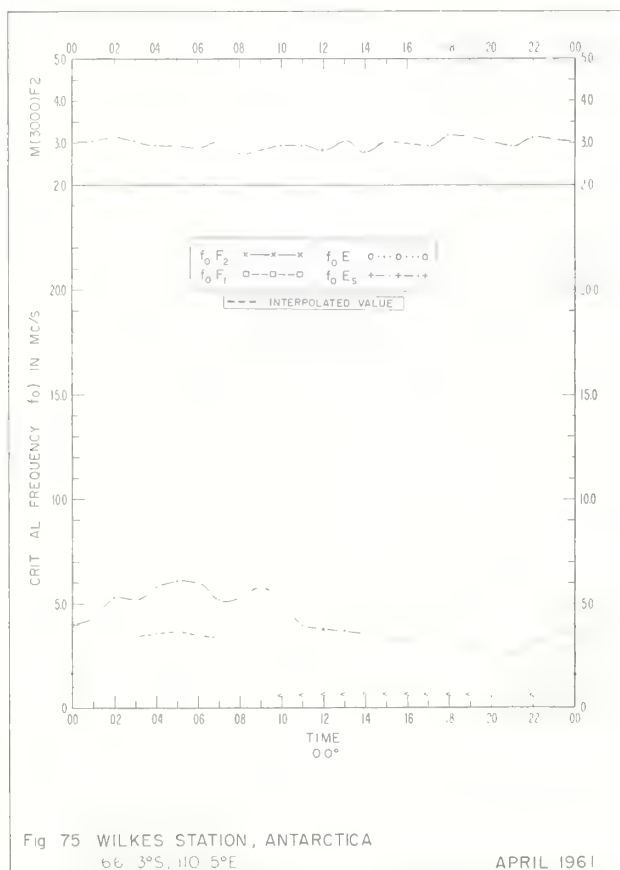
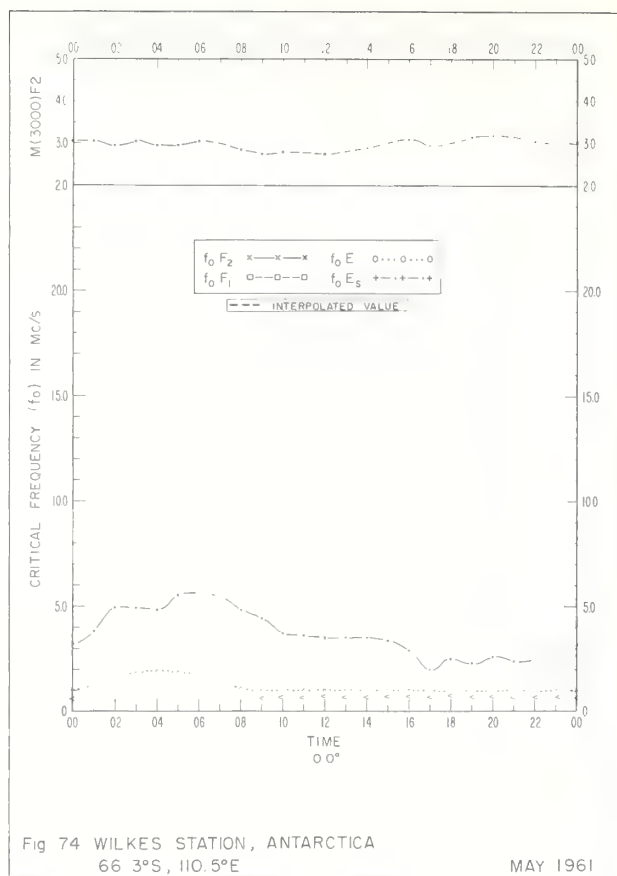
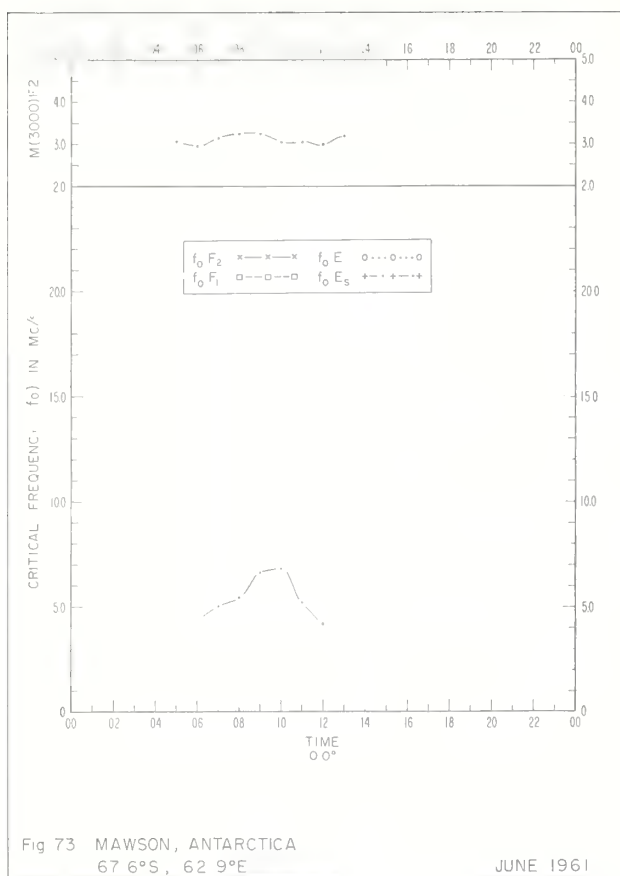


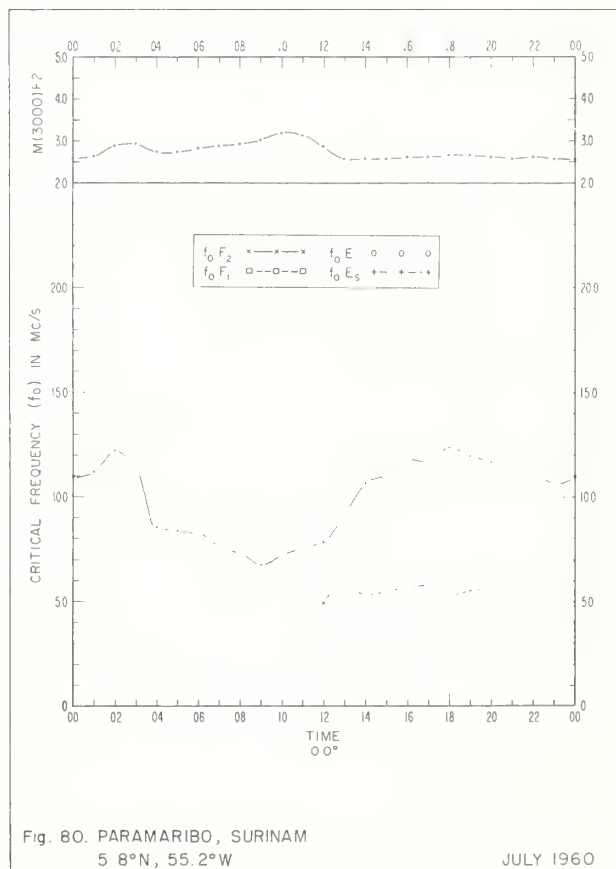
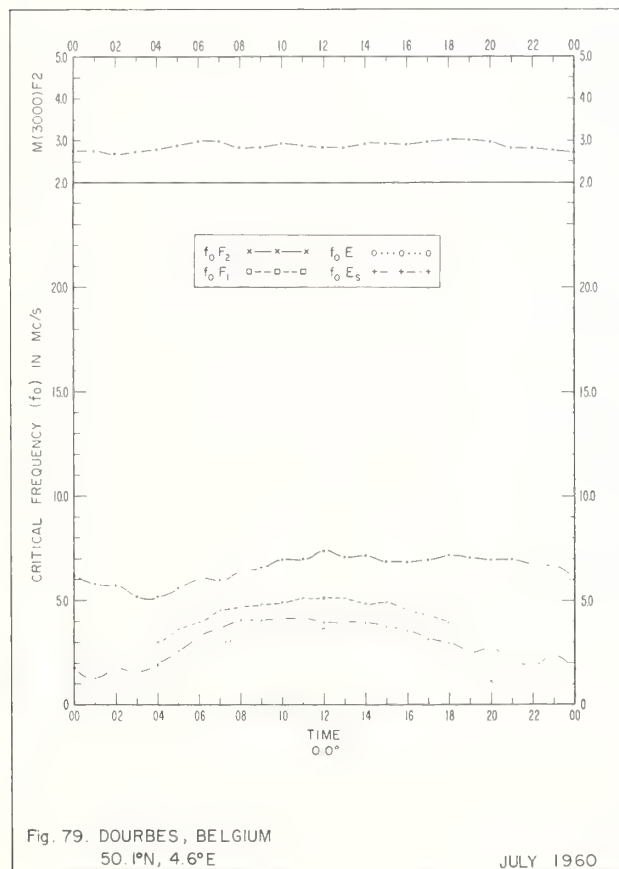
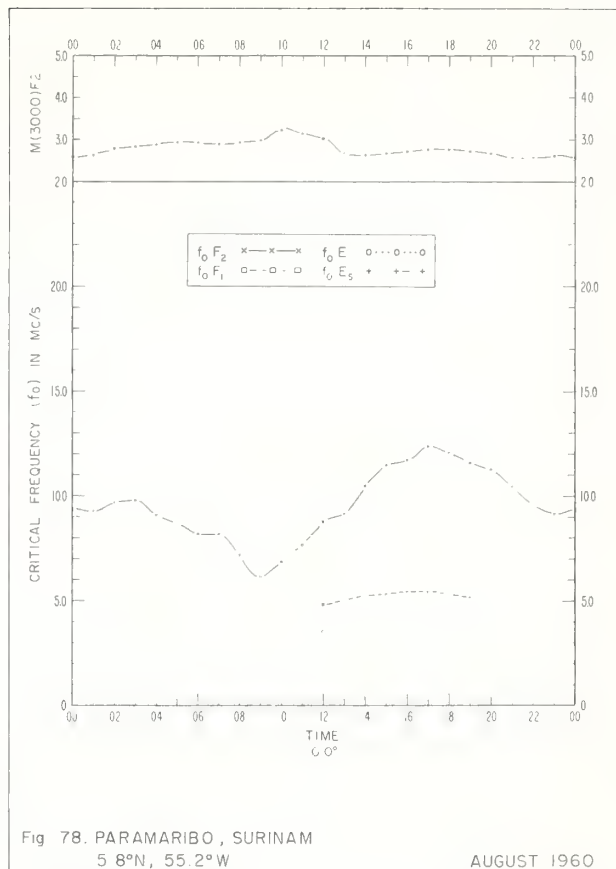
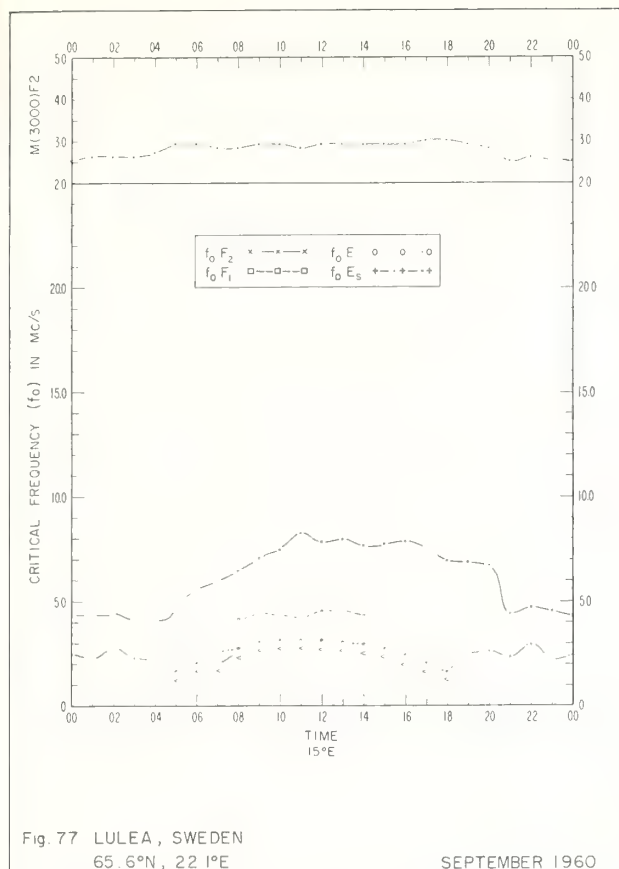


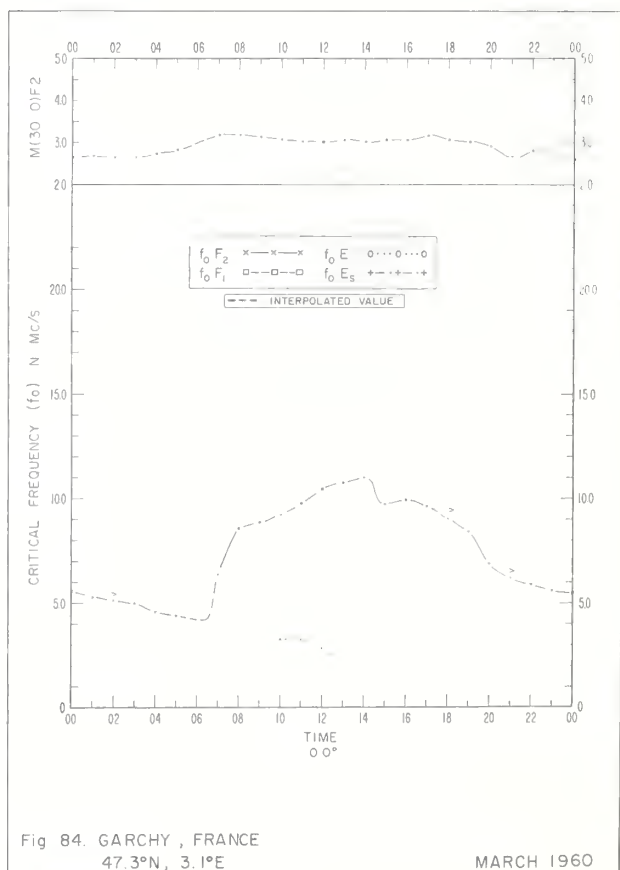
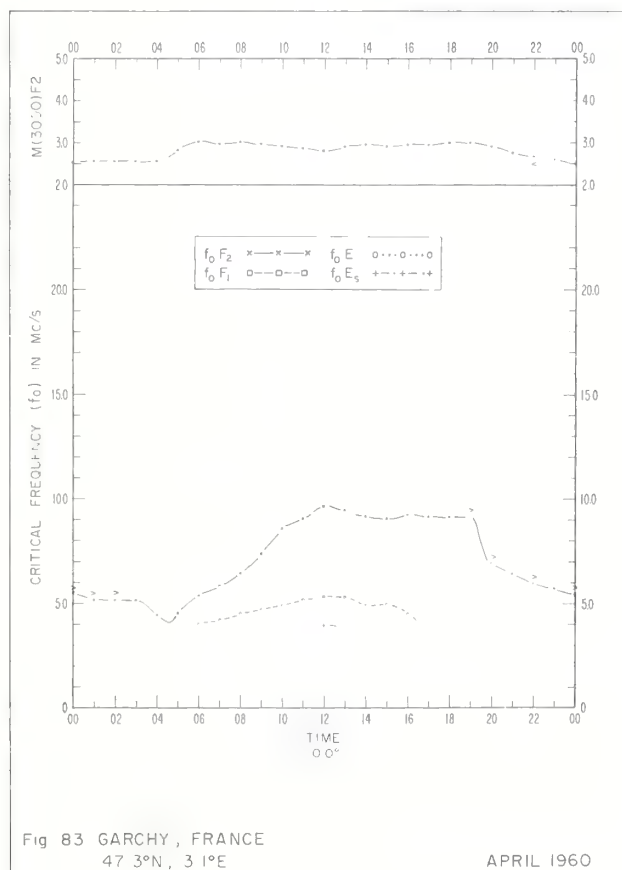
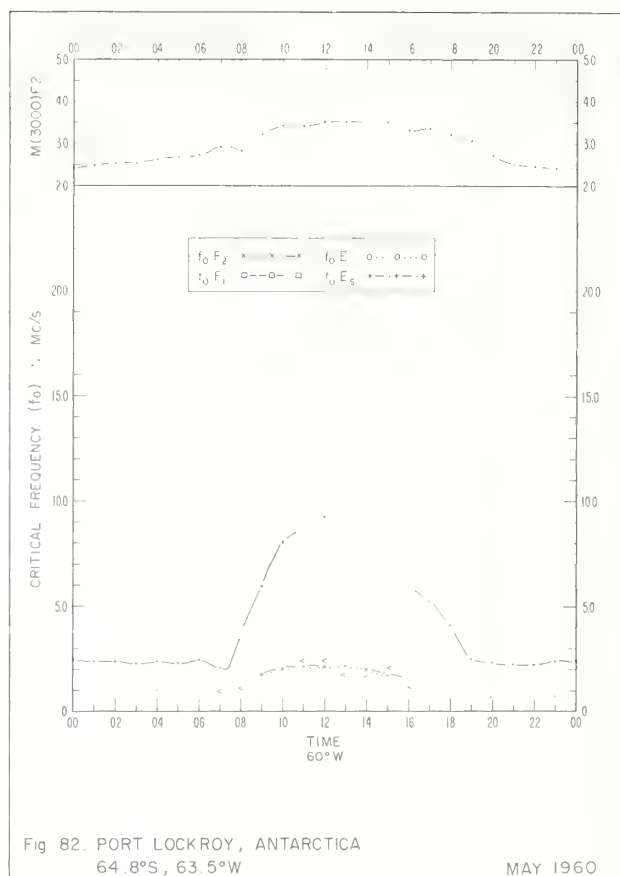
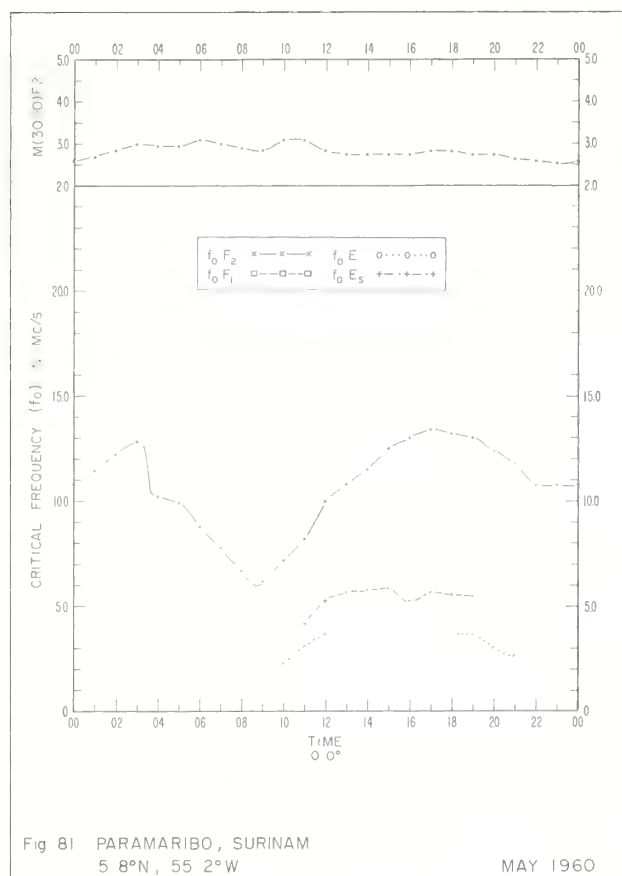


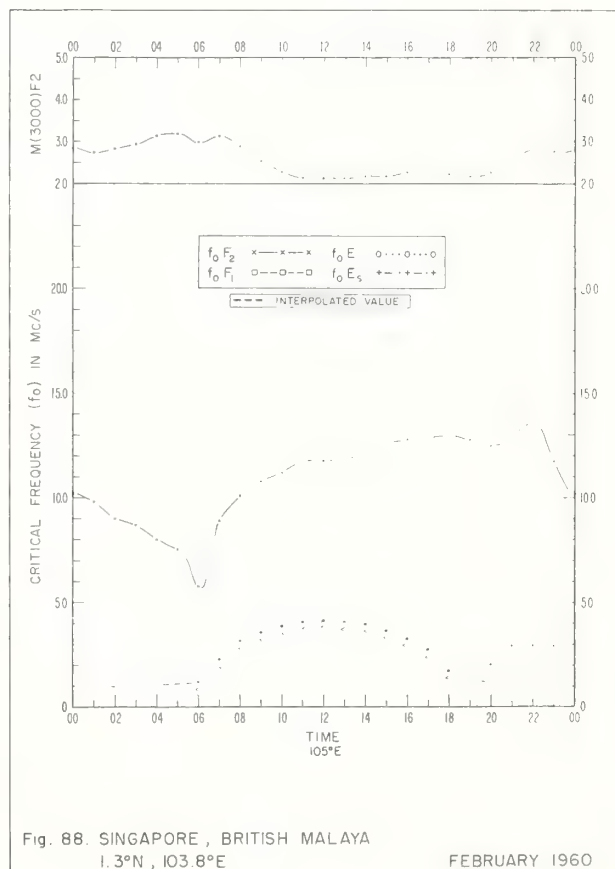
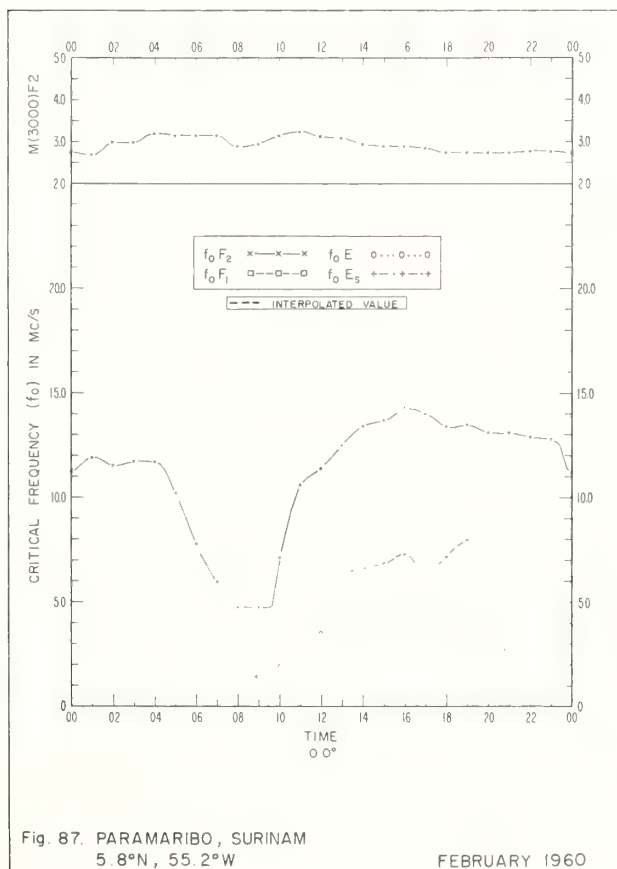
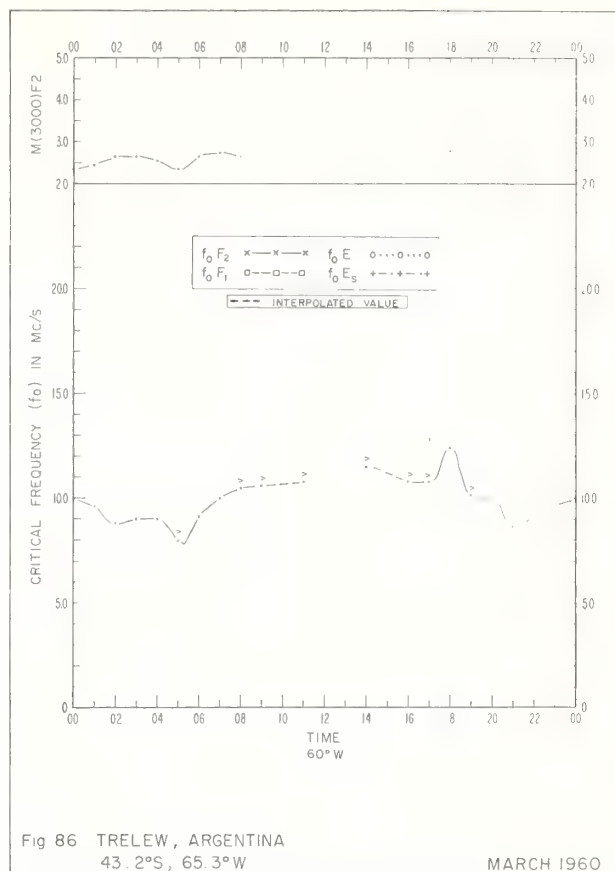
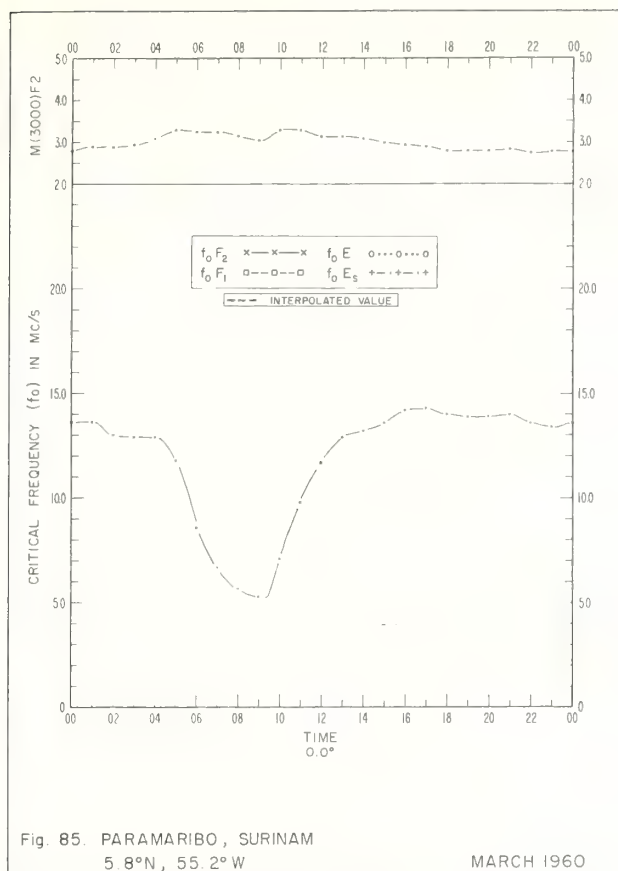


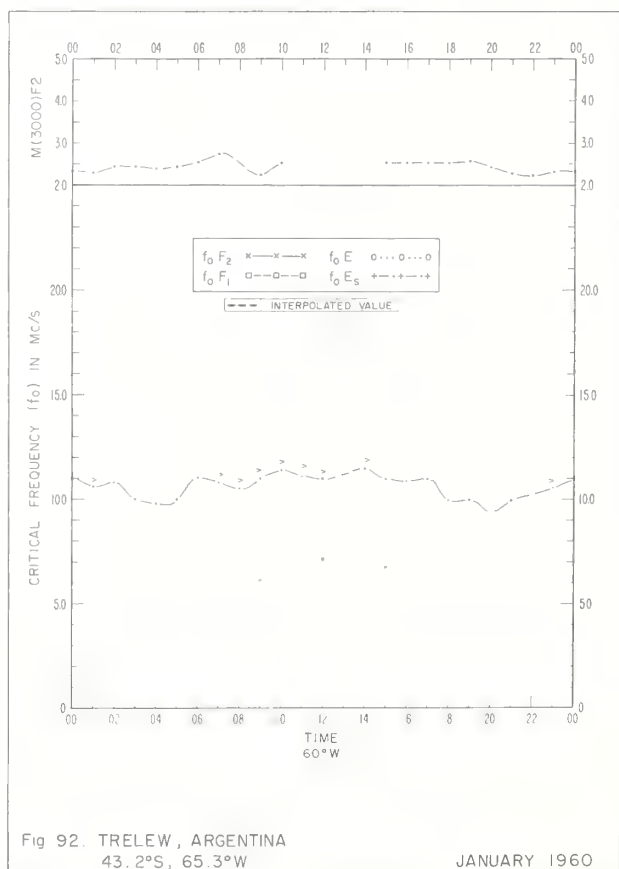
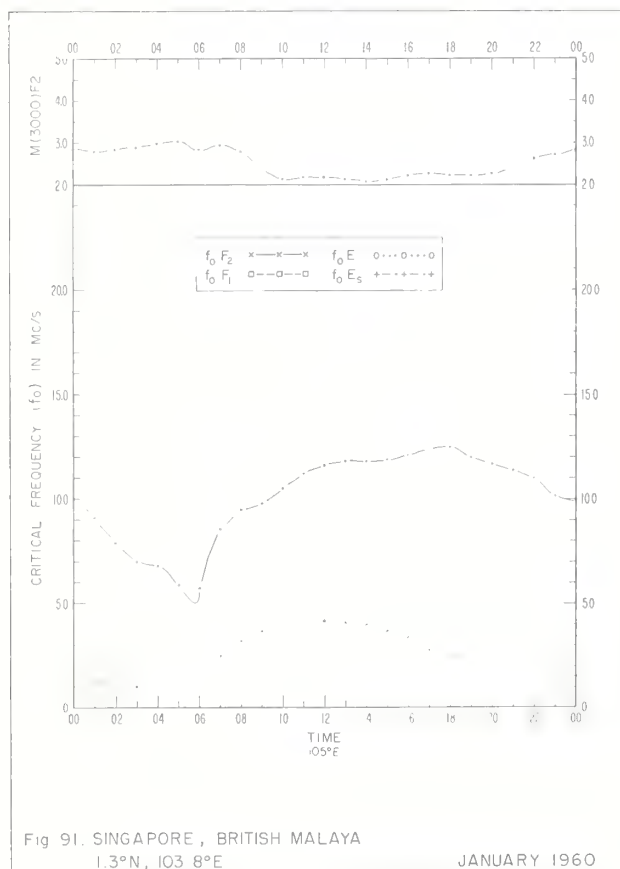
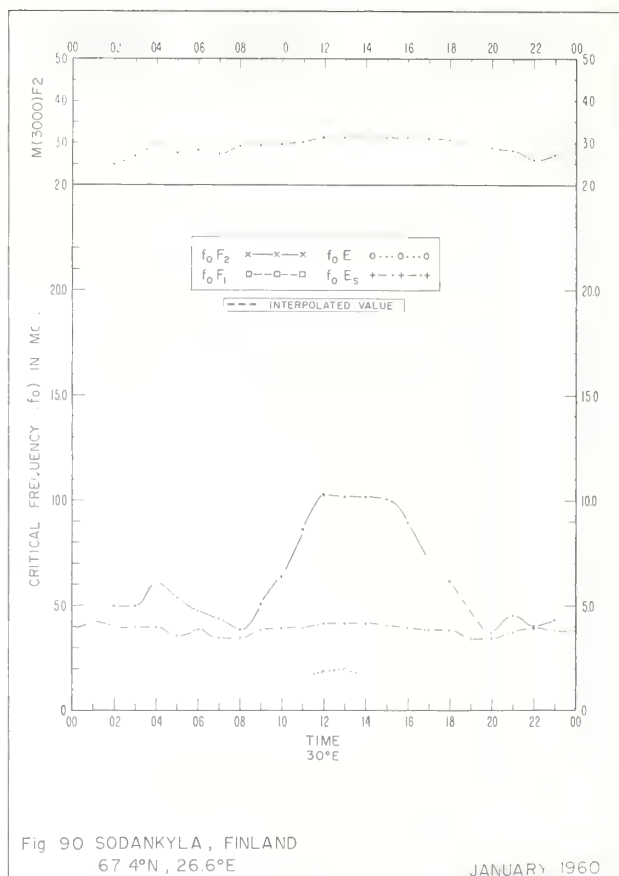
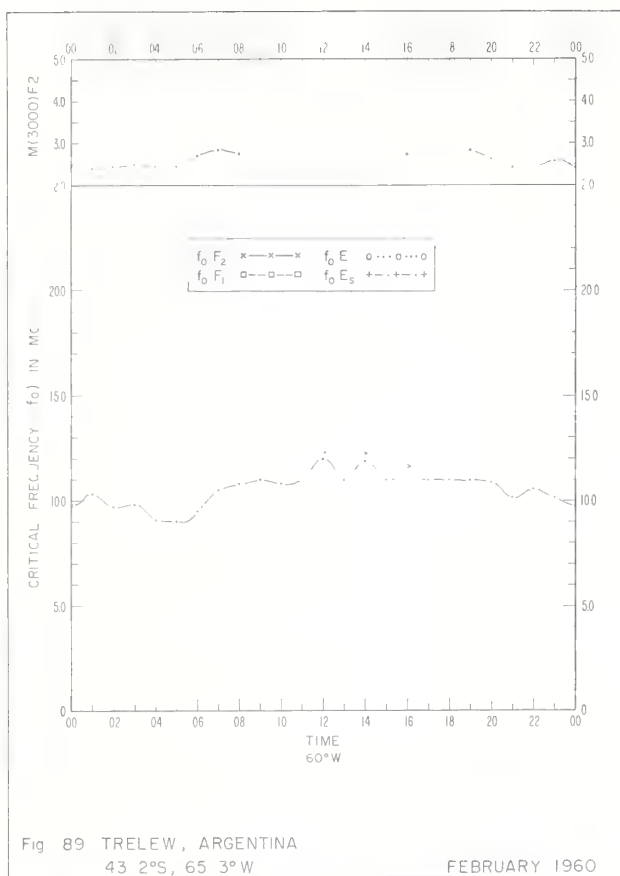


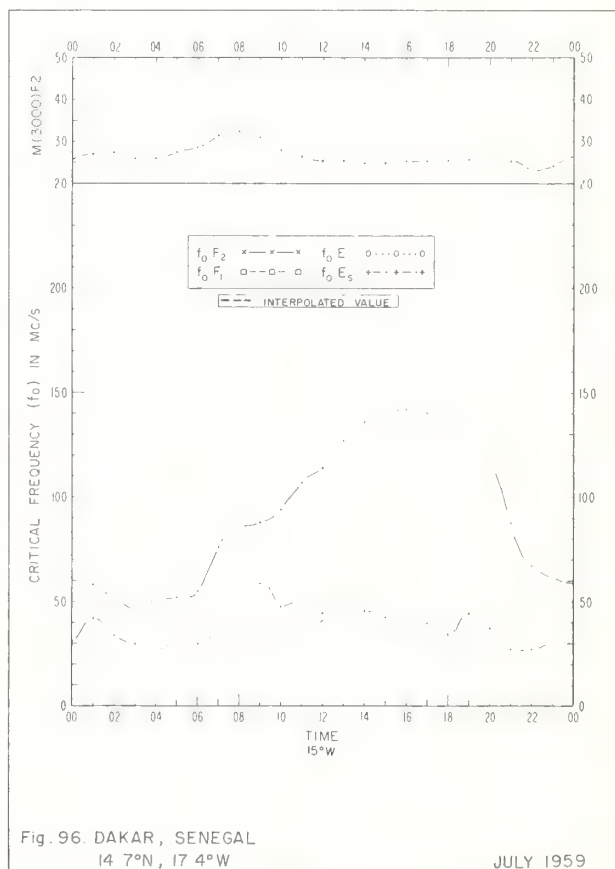
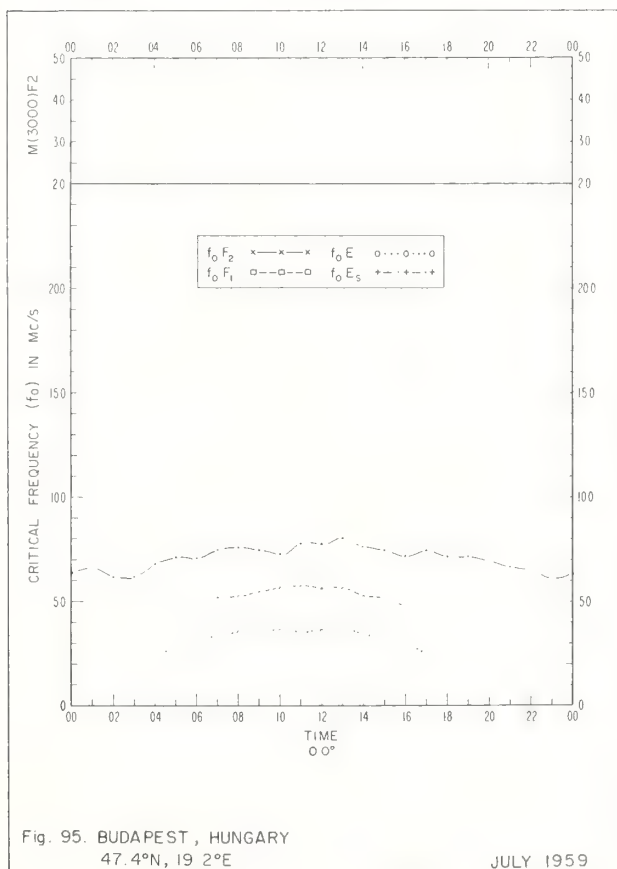
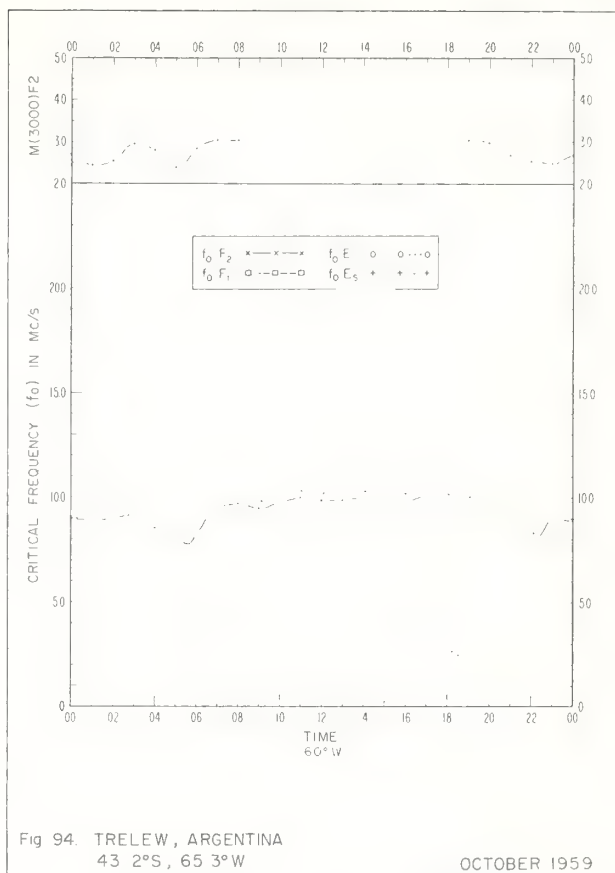
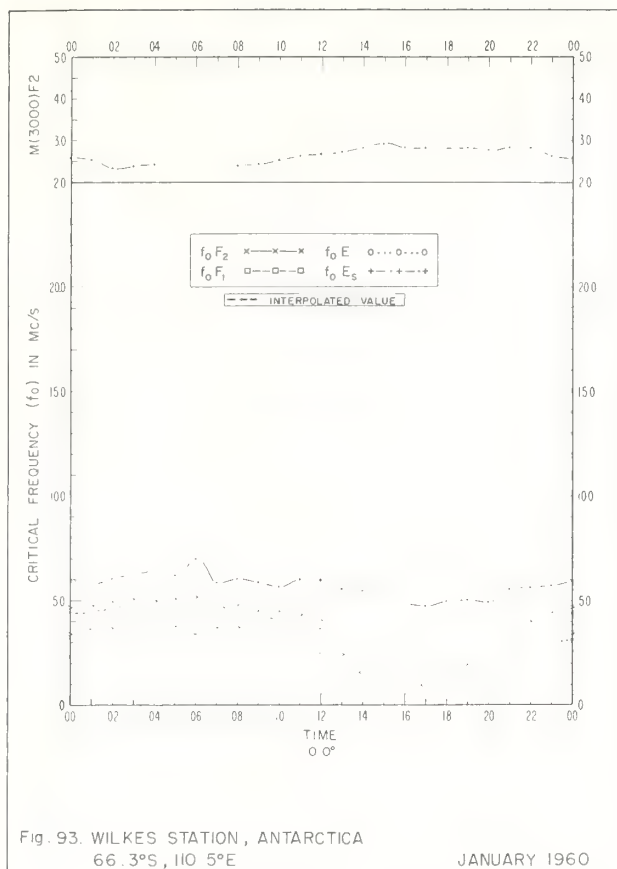


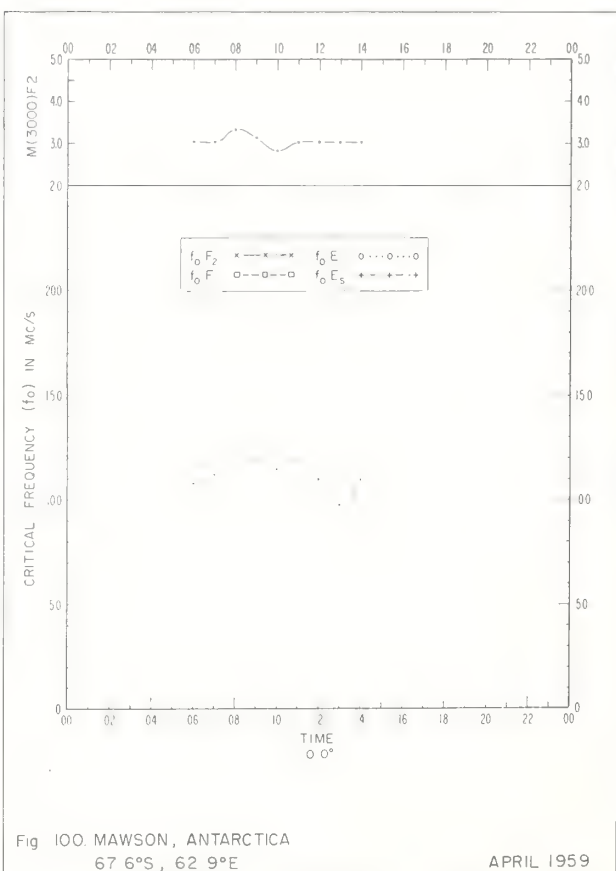
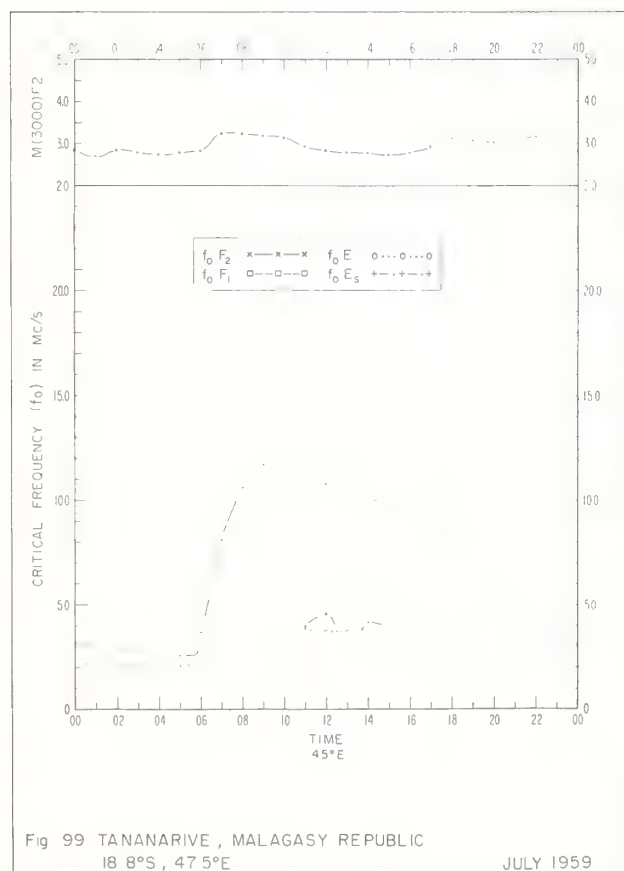
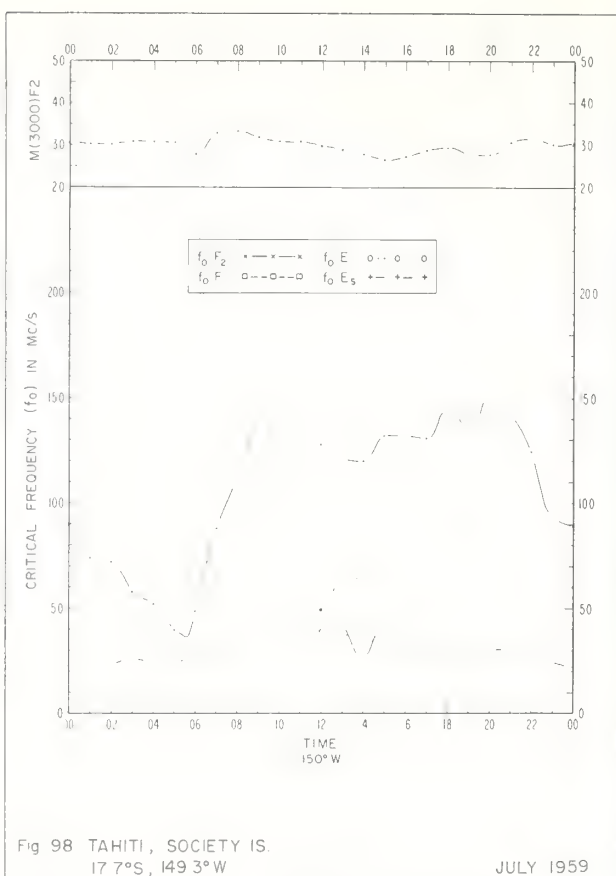
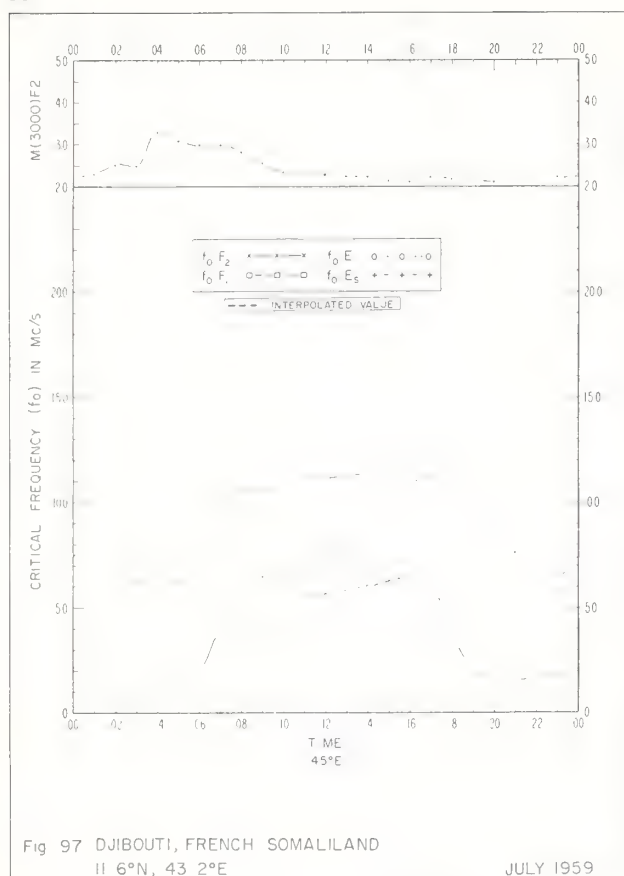












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AHMEDABAD, INDIA	1960	NOV.	19	44
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ANCHORAGE, ALASKA	1963	JULY	1	26
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BARROW, ALASKA	1963	AUG.	1	26
BUDAPEST, HUNGARY	1959	JULY	24	49
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	1962	AUG.	15	40
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	1961	DEC.	17	42
	1963	MAR.	5	30
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DJIBOUTI, FRENCH SOMALILAND	1959	JULY	25	50
DOURBES, BELGIUM	1960	JULY	20	45
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A catalog of records and data on file at the U.S. IGY World Data Center A for Airglow and Ionosphere, Boulder Laboratories, National Bureau of Standards, Boulder, Colorado, which includes a fee schedule to cover the cost of supplying copies, is available upon request.

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